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BUILDING BETTER

A Look at Best Practices for the Design of Project Labor Agreements

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Executive summary

Project labor agreements (PLAs) are a type of contract used in the construction industry to set the terms and conditions of employment on large projects of long duration and design complexity. PLAs allow the expeditious resolution of disputes that can arise in the course of the project, thereby helping to ensure that the project is delivered on time and that quality standards are maintained. Recently, PLAs have begun to include provisions that seek to improve conditions on the worksite (e.g., health and safety rules) and provide benefits to the community by including jobs and training opportunities for disadvantaged workers and carve-outs for small or minority-owned businesses.

Although PLAs have been around for years and used on some of the most famous construction projects in American history, their use has become controversial as the nonunion sector of the construction industry has grown and as PLAs have been applied to relatively small projects. Critics argue that PLAs place nonunion contractors at a disadvantage in bidding on projects and raise overall project costs. PLA opponents are particularly critical of the use of PLAs on public projects. They argue that such usage violates the spirit of public bidding statutes by requiring the adherence to collectively bargained terms and conditions of employment as a prerequisite for winning a contract.

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If designed properly, PLAs can help projects meet deadlines by guaranteeing a steady supply of highly skilled labor through the building and construction trades unions' nationwide network of referral systems and by reconciling the various work routines of the many trades. PLAs also help to assure timely completion by keeping projects free from disruptions resulting from local labor disputes, grievances, or jurisdictional issues.

PLAs can improve efficiency and promote innovation by prohibiting restrictive work norms, by improving coordination in work flow, and by supporting experiments in changing the work environment. In addition, many PLAs include highly developed systems of labor/management cooperation.

Language in PLAs can be written to advance important policy goals, such as improving training and recruiting members of disadvantaged communities into high-paying jobs in construction.

Often PLAs, particularly those on large projects, contain sophisticated health and safety provisions, including those that dictate overall safety practices, create safety committees, mandate safety training and safety meetings, and address such matters as drug screening.

While nonunion contractors are the most vocal PLA opponents, many PLAs accommodate nonunion firms by, among other things, prohibiting discrimination in bidding based on union status and allowing nonunion firms to bring at least certain core workers with them to projects. Evidence suggests that, where they have attempted to gain PLA work, nonunion firms have been successful in competing for it.

One successful method that is used in many parts of the country for negotiating PLAs is their development by local labor/management councils. Such groups can use the AFL-CIO Building and Construction Trade Department's model PLA and include language to accommodate local concerns. A local model PLA can then be fashioned on a job-by-job basis to meet the needs of the owners and community groups that might have a stake in a project.

We hope that this report can move the PLA discussion beyond a debate about whether PLAs are good or bad and toward a more constructive discussion regarding how to create PLAs that help deliver better projects for owners, contractors, workers, and communities.

Introduction

What is a project labor agreement?

The construction of major projects such as highways, bridges, and power grids entails the careful coordination of large numbers of individual contractors and their workforces, often under demanding time schedules and design specifications. Failure to meet project deadlines or quality standards can be costly to the businesses and agencies involved and to the public at large. Project labor agreements (PLAs) are a type of contract used in the construction industry to set the terms and conditions of employment on large projects of long duration and design complexity.

The longstanding purpose of PLAs is to resolve expeditiously disputes arising in the course of the project, thereby helping to ensure that the project is delivered on time and that quality standards are maintained. PLAs in more recent years also include provisions that seek to improve conditions on the worksite (e.g., health and safety rules) and provide benefits to the surrounding community (for example, by including jobs and training opportunities for disadvantaged workers).

Two basic design features allow PLAs to meet the twin goals of creating greater uniformity in labor contracts and minimizing disruptions that can occur on major construction projects. First, the typical PLA is negotiated by a local building and construction trades council (BCTC) and a construction management firm with the goal of reconciling the differing provisions found in local labor agreements across the building trades unions. For example, each local union's collective bargaining agreement may have different benefits and premium-pay provisions, different hours-of-work provisions, and different work rules. When many trades are working together on a single project over a long period, it makes sense to reconcile differing contract provisions within a master agreement.

The second fundamental design feature in PLAs offers the construction user—typically called the owner—assurances that work will be undertaken without disruption and that disputes will be resolved expeditiously without causing delays to project schedules. Accordingly, one provision that is nearly universal in PLAs is that work continues on a project no matter what conflicts arise on the project or off. Therefore, even if a building trade union is on strike in a local area, work on a PLA-covered project continues; disputes on the project itself are handled through labor/management committees and grievance procedures culminating in binding arbitration.

Along with these basic elements, PLAs can contain a variety of provisions relating to health and safety practices, training, recruitment of local workers, and operational issues. They may also include favorable language for owners and contractors on compensation and work rules.

History of PLAs

Although the term is relatively new, PLAs have been around for many years. During World War I, American Federation of Labor President Samuel Gompers and Secretary of War Newton D. Baker agreed that military cantonments would be built under a union pay scale in exchange for the unions giving up a request for a closed shop on such projects (McCartin 1997). During and immediately after World War II, agreements that were particularly popular at atomic energy and space and missile sites provided for uniform shift and overtime rates along with no-strike guarantees (Dunlop 2002). Iconic American projects such as Hoover Dam and the Trans-Alaska Pipeline were built under PLAs.

PLAs continued to be used with little controversy in both the private and public sectors throughout the postwar period—a period during which much of the construction industry was highly unionized. With powerful unions, there was a strong desire on the part of owners and contractors to avoid labor disputes and gain the best economic deal possible relative to local agreements. The climate changed, however, in the 1970s and 1980s, when union market share dropped and construction users and the nonunion sector became better organized (Linder 1999). In the new environment, with large nonunion contractors able to compete for all types of work in most states, and with the growing strength of a nonunion contractors' association—the Associated Builders and Contractors (ABC)—challenges to PLAs became more common. In the past decade, all branches and levels of government have entered the PLA debate (Cockshaw 2003; U.S. Senate 2000).

Why are PLAs controversial?

Because PLAs require that all contactors working on a project adhere to a collective bargaining agreement, even nonunion contractors must operate under negotiated rules. These contractors complain that PLAs remove their competitive advantage, require them to use union workers from hiring halls rather than their own employees, and require them to contribute to union-sector health care and pension funds from which their own employees are unlikely to benefit (ABC 2001). Opponents of PLAs argue that they frequently add costs to projects that benefit only the contractors and workers, not the general public.

Private sector owners may place nearly any conditions they like on their projects; even so, private sector PLAs often restrict bidding to unionized contractors. On public projects, however, state and federal bidding statutes and regulations must be followed. Therefore, much of the controversy surrounding PLAs is whether, on government projects, they violate public bidding statutes by placing a condition on successful bidding (i.e., the willingness to sign a PLA) beyond the requirement of being the "lowest qualified bidder."

As public policy has developed, most courts have held that governments may use PLAs on public projects as long as bidding is open to all qualified bidders (union and nonunion) and due diligence has been done to determine the cost effectiveness of the PLA. On a practical level, this means that the benefits of improved coordination and management offered by the PLA can outweigh any additional costs that might arise from their use. Whether they do depends on the provisions of the PLA and how they are implemented by the parties on the project.

At the federal level, PLAs have been something of a political football. Their use was prohibited on federally funded projects at the end of George H.W. Bush's administration, encouraged during the Clinton administration, essentially prohibited during George W. Bush's administration, and, again, encouraged under the Obama administration (see Executive Order 13502, February 6, 2009). Federal regulations pursuant to the implementation of President Obama's executive order appeared in the Federal Register on April 13, 2010.[1] As evidence of how contentious the issue of PLAs can be, the public comment period on the federal regulations in the fall of 2009 yielded nearly 700 responses, pro and con.

The purpose of this report

Passions in the PLA debate often eclipse reason. But PLAs should be viewed for precisely what they are: a tool to provide value on construction projects. Because PLAs have many elements, and differ considerably in terms of which elements are used and how they are carried out in practice, an agreement's success at adding value is dependent on design choices and how its provisions are implemented during the project. This report focuses on best practices that have helped parties make the most of their agreements. Accordingly, rather than rehashing the PLA debate, we offer advice on such matters as assuring timely projects, maximizing efficiency and innovation, supporting community development, improving health and safety, resolving disputes, accommodating nonunion contractors, and negotiating PLAs. We hope this report can be used by parties to craft better PLAs and achieve success on their construction projects.

The construction industry

For convenience we speak of the construction industry, but construction comprises several distinct industries and is organized around occupations rather than employers. Construction projects are temporary, as are most construction jobs. Craft workers and professional employees in the industry move between employers to remain employed, and these continual transitions result in a weak attachment between employers and employees. Demand for construction and, therefore, construction workers is cyclical. In addition, immigrants, as historically has been the case, make up a large and increasing part of the construction labor force. In this section, we will discuss each of these characteristics of the industry.

Even though the construction sector is devoted to building things—except, of course, for those segments that specialize in tearing things down—there are marked differences in the work, technology, financing, and labor forces between industries. Perhaps the most obvious difference is between residential and all other construction. Residential construction firms are typically small, operate in markets with vigorous price competition, and employ workers with less training and fewer skills. But there are also meaningful differences between other parts of construction. For example, highway construction depends on public works expenditures, industrial construction is driven by demand for manufacturers' products, and large commercial projects require capital from banks and outside investors.

The occupational structure of work and the occupational structuring of firms distinguishes construction from other industries. Construction workers are defined by their occupation more so than by their employers. Skill development is specific to a trade—electricians do not have the skills to do the work of carpenters or pipefitters—and once workers have acquired substantial skills within a trade they usually remain in that trade. Moreover, most firms are occupationally structured. They provide a specific type of service, such as electrical contracting, plumbing, pipefitting, painting, or roofing. Even general contractors seldom employ more than the basic trades—for example, carpenters, ironworkers, laborers, operating engineers, and bricklayers—and may obtain even these workers by subcontracting with specialty employers. The occupational structure of construction makes skill development central to the success and efficiency of the industry and supports the easy movement of employees between employers.

Construction is unique among the goods-producing industries in being dominated by small employers and establishments. Although there are well-known large employers such as the Bechtel Group, Bovis Lend Lease, Skanska, and KBR, to name a few, only 15% of all construction workers are employed by contractors with 250 or more employees—about

a quarter (24.4%) work in firms with nine or fewer employees—and of the 710,307 establishments in the construction industry only 163 have 1,000 or more employees (U.S. Census Bureau 2005). The small number of employees in most firms is due to workers being specialized not only by trade but by type of work. Hence, an electrician, for example, may work for a firm that specializes in residential work or industrial work or in the installation on lighting on highways. Except for the very largest firms, construction employers typically operate in local or, at most, regional markets.

Construction projects are inherently temporary. Consequently, a contractor's volume of work and the number of employees it needs vary considerably over time. The workforce has to be mobile between projects, and often between employers. Historically, building trades unions have served as labor market intermediaries that provide a clearinghouse for labor to contractors and serve as a guarantor of the skills of the workforce and conditions for craft workers. In conjunction with signatory (i.e., unionized) employers and their associations, the unions provide training and health and welfare benefits to a mobile labor force. At the same time, however, workforce mobility makes relations between the unions and the employers less stable than in other industries.

The complexities created by the small size of construction employers and the transient nature of construction projects are compounded by the multifaceted organization of construction projects. That is, no single company builds a project. Rather, parts of every project are subcontracted out to firms that specialize in the type of construction needed. A building construction project is likely to involve site preparation, foundations, framing, roofing, electrical work, plumbing, heating and cooling, drywalling, painting, and flooring. In many cases, some or all of these tasks will be contracted to subspecialty firms. As a result, many employers and craft workers will operate—or need to operate—on the same site at the same time. Coordination of multiple contractors is a critical and challenging task, one which, if poorly done, will have negative effects on timeliness and quality. Successful coordination of multiple employers and trades is the hallmark of good projects. However, successful coordination of projects has been complicated during the past several decades as general contracting firms have evolved into construction management firms. Historically, general contractors took overall responsibility for successful completion of a project, and they assumed the financial risks and rewards of that responsibility. In contrast, construction managers serve the owner by coordinating and overseeing the contractors and subcontractors, but they do not take on financial risk if a project goes poorly. The shift from the general contracting to the construction management model complicates lines of authority and incentives.[2] Whatever the management structure of a project, the fundamental complexity of the construction worksite makes coordination across trades and contractors important to the project's success.

The decline of union representation in the construction industry over the past 40 years coincides with an increase in issues related to worker training and a shortage of skilled craft workers. Training highly skilled craft workers requires multi-year programs that combine classroom training and on-the-job experience. In the past, much of the training of construction workers took place in apprenticeship programs overseen by joint labor/management committees. These programs were financed by contractually mandated employer contributions determined by the number of hours worked by a trade. The joint governance structure proved to be effective in providing broad skills training economically. With the large-scale shift to nonunion employment, the apprenticeship system has declined. The lack of large-scale training systems in the nonunion sector was not an issue for many years because many of its workers had been trained in joint apprenticeship programs. Over the past 20 years, however, the lack of effective training systems in the nonunion sector has increasingly affected the ability to deliver high-quality projects. Thus, training has become an issue for construction stakeholders.[3]

Because the construction industry is very sensitive to demand conditions and changes in interest rates, construction workers face higher and more volatile unemployment than workers in the balance of the economy. For example, the nation's overall annual unemployment rate ranged from 4% to 6% between 2000 and 2007, while the rate in the construction industry was 6.2% to 9.3%.[4] Monthly rates show even greater variability. The average difference in the high and low monthly unemployment rate in these years was only 1.05% for unemployment overall, while the figure

for the construction industry was 5.88%, or over five times higher.[5] Another example can be found in recent unemployment rates. While the national unemployment rate was 9.5% in June 2010, the unemployment rate in construction was 20.1%.[6]

Construction has been and continues to be a port of entry into the labor force for immigrant workers. Just as large numbers of immigrants from Ireland, Italy, and Central Europe once entered construction soon after entering the United States, construction has more recently served as an important source of employment for new immigrants from Central and South America. Research by the Pew Hispanic Center found that, in 2006, 75% of Hispanics employed in construction were foreign born. Between 2003 and 2006, Hispanic employment in construction rose from 11% to 15% of total employment and provided 40% of the increase in employment among Hispanics during that period (Pew Hispanic Center 2006). The influx of immigrant labor provided an important support for the housing boom of the early 2000s, but may have exacerbated problems with earnings and employment conditions, particularly in residential construction.[7]

Understanding these distinctive characteristics of construction helps us to understand why and how PLAs can be used to deal with complexity on large projects of long duration. PLAs can control some of the uncertainty in an otherwise diverse and decentralized industry.

Designing PLAs to meet project deadlines and quality standards

PLAs can be an effective tool for ensuring that projects are completed on time. Delays create inconveniences and costs for everyone. The school that is not ready for the first day of the new year may force the use of temporary and overcrowded facilities and necessitate a mid-year move. The highway that is not completed on time continues to cause travel problems for commuters and truckers, which result in real costs to a local economy. The factory that is not finished cannot produce revenue for its owners. Moreover, project delays impose additional costs for borrowers and are often the root causes of construction litigation.

Delays in construction projects are not unusual and have many sources. Sometimes, they are related to inadequate numbers of available and appropriately skilled workers. They may also be caused by weather, by materials being lost on the site or arriving late, by problems associated with financing or insufficient planning, or by the unavailability of contractors at the time when their services are needed. Although no one project may suffer delays from all of these sources, delays are common in construction, and timely completion of a project often requires adjustments to work schedules and labor requirements to bring it back on schedule.

Interviews we have conducted with more than one hundred individuals involved in various aspects of construction—e.g., owners, contractors, contractors' association staff, and union officials—on scores of projects[8] reveal broad satisfaction with the ability of PLAs to assure timely completion. Where delays were experienced, they were usually unrelated to labor issues.[9] In fact, the anecdotal evidence suggests that some projects would have experienced schedule delays were it not for the interventions made possible in the PLA.[10] For example, there were instances in which remaining on schedule required bringing in out-of-area workers at critical points in projects. Absent the local unions' commitment in the PLA to providing labor on a timely basis, it is likely that the local unions would have been far less willing to give up work for their members.

PLAs act to improve timeliness through several mechanisms. First, all PLAs include provisions that commit the local unions to provide labor on a timely basis, usually within 48 hours. This commitment is supported by arrangements between union locals to facilitate the movement of skilled labor to areas of labor shortage. Second, most PLAs proscribe work disruptions—strikes, slowdowns, wobbles, and other labor actions—and provide mechanisms by which disputes can be anticipated and peacefully resolved. The presence of these bans, and the provision of dispute resolution mechanisms, supports timeliness both by removing many of the causes of disruptions and by emphasizing the importance of timeliness to all project stakeholders. Third, many PLAs include provisions to harmonize work time and promote the

efficient utilization of labor, thereby improving project performance. Finally, obtaining the commitment of all of the stakeholders—owners, contractors, union officials, and workers—through a PLA supports an understanding of the requirements of the project and encourages a positive identification with the ends of the project, including getting the job done on time.

Commitment to the timely provision of skilled workers

PLAs can include provisions that commit local unions to actions and practices that allow contractors to operate efficiently and with the confidence that there will be access to the workers required for the project. The quid pro quo for using local unions as an initial source for skilled workers is that union locals agree to provide the labor needed for a project quickly, usually within 24 to 48 hours. By way of example, the Tappan Zee Bridge, which spans the Hudson River just north of New York City, was upgraded using a PLA that included a commitment that unions provide labor on a timely basis:

> The Contractors agree to hire on the Project craft employees covered by this Agreement through the job referral systems and hiring halls established in the Local Unions' area collective bargaining agreements....In the event that a Local Union is unable to fill any request for qualified employees within a 48 hour period after such requisition is made by the Contractor (Saturdays, Sundays and holidays excepted), the Contractor may employ applicants from any other available source.

Similar language can be found in almost all PLAs. Such language commits unions to make available skilled workers quickly, and allows contractors to seek alternative sources of labor if the unions cannot provide it, allows better coordination of project workforces, bans job actions, and provides for immediate means of dispute resolution.

Recruitment of workers from outside the region

The agreement with the local unions does more than provide access to local craft workers. Local unions have arrangements through their international parent organizations to allow for union members from other locals to work on a project when the local labor force is insufficient. With adequate notice, even large projects can recruit a labor force of workers with established employment records from around the nation. The arrangement the locals have with their internationals has proven important for large projects, especially projects in regions with low population density. For example, the construction of the General Motors assembly plant in Lansing, Mich. in the early 2000s was not hampered by the extremely tight labor markets of the time because appropriately skilled labor could be drawn from the Midwest and, if necessary, from other regions of the country. In contrast, trade publications reported numerous delays and price escalation on large construction projects in the years leading up to and during this project.[11]

Ban on job actions

The complex organization of work and responsibilities on construction sites create considerable potential for misunderstandings and disagreements concerning the "ownership" of work and how the work is to be accomplished. Since construction sites are temporary workplaces, contractors and workers constantly have to determine how to work together to produce a successful project. Unlike a permanent workplace, where issues of who is supposed to do what have been spelled out, in construction these matters often must be resolved anew on each site. The inherent lack of organization on construction sites becomes more complex due to the uncertain lines of authority, particularly on sites overseen by a construction manager. Problems arise frequently because construction plans are often incomplete when projects are bid by contractors. Consequently, many of the details of the work, deliverables, and cost are determined once the project has begun, and decisions have to be made expeditiously so as not to delay work. Therefore, the details of the contract and subsequent decisions are often made onsite, a pressure adding to an already complex situation.

The assignment of work is a frequent source of dispute between contractors and between workers on both union and nonunion sites. In some instances, parties try to claim the work; in others they try to avoid it. On union projects, disagreements over the ownership of work are usually jurisdictional disputes—that is, a disagreement between unions over which union's members should do the work. These disputes may arise when mid-project changes occur or when changing technology blurs craft lines. Despite conventional wisdom, delays about who should do what are not unique to the union sector. Nonunion worksites can also suffer delays when contractors do not agree on the scope of their work.

Work can also be disrupted by labor disputes. On union sites, work can slow or stop due to contract negotiations, disputes over jurisdiction between trades, safety disagreements, or other issues. Nonunion worksites can also be affected by slowdowns, walk-offs, excessive absenteeism, and other labor problems when employees and contractors are in conflict. For institutional reasons, disputes on union sites are more visible, but disputes between contractors and workers on both union and nonunion sites can seriously impede work.

The no-strike/no-lockout language and the dispute resolution processes (discussed more fully in a later section) provided in PLAs have proven to be highly effective in preventing disruptions on union worksites. The dispute resolution provisions of most PLAs (1) provide an expeditious means to resolve any strike or work slowdown, (2) commit union leaders and contractors to take immediate action to resolve the problem and resume work, and (3) impose large and rapidly increasing penalties when strikes or slowdowns occur. The success of PLAs in addressing work disruption issues is demonstrated by the very small number of work stoppages and slowdowns on projects built under PLAs.[12] However, if work disruptions occur, then the disputes are resolved rapidly and prior to serious the consequences that could result. For example, a wildcat work stoppage at the San Francisco Airport in May 1999 under other circumstances might have lasted much longer, but the dispute was resolved in less than 24 hours due to the union leaderships' commitment under a PLA.[13] Although the occurrence of any stoppage might be viewed as a failure, the success in quickly ending the work stoppage was only possible because of the PLA.

Language to foster efficiency and reduce time to completion

PLAs promote practices that increase project efficiency and may shorten time to completion. One important practice is the harmonization of working hours. For historic reasons, different trades may have different rules about starting times, the number of holidays and the dates when holidays are taken, allowable shift schedules, breaks, and methods of determining overtime. This can result in situations in which carpenters start and end their shifts an hour after electricians, or pipefitters take a day off on Friday when a holiday falls on a weekend while other trades take the day off on Monday.[14] Because of the need for coordination between trades, such differences result in inefficient use of time and/or an excessive use of overtime. By coordinating starting times, holidays, and other work rules, PLAs can improve efficiency, as well as reduce project times and cost.[15]

Another important practice is the creation of labor/management committees to oversee projects and anticipate problems before they occur. For example, many PLAs now include language on pre-job conferences, which permit the parties to discuss issues and resolve them ahead of time rather than wait for them to come up during a project. Determining whether ironworkers or millwrights will do a particular task can be determined at the outset, avoiding any delay that might occur if the decision is left until the start of the task. Similarly, as information about unanticipated problems becomes available, the committees can review the problem and find a solution on the front end to avert delays.

The success of PLAs depends, in part, on craft workers, union officials, and contractors' identification of the project as one in which each participant has a role in making a success. In the course of our interviews, we frequently heard that stakeholders' identification with PLA projects and their investment in the success of the project underlie easier dispute resolution. Jurisdictional issues that might have been fought out at length on other projects were ceded because the

parties wanted the project to move forward without impediment. Labor leaders also indicated that they expected reciprocity on the next PLA; if the Carpenters Union gave up work on this PLA, the Laborers Union would give up work on the next one. Often times, the parties preferred that issues be resolved without the involvement of the project owner. Toward this end, issues were resolved at the lowest level possible.[16]

Most PLAs are negotiated locally. Local negotiation plays an important role in creating understanding and identification with a project on the part of the local union representatives and membership. There are, however, national agreements, such as the Toyota PLA. Although the content of these national agreements is similar across projects, local building trades councils are part of negotiations between the owner and the AFL-CIO's Building and Construction Trades Department. This involvement assures that the members of the local council, who will be signatory to the agreement, understand the agreement and the gains and responsibilities it confers. Local involvement can also play a critical role in adapting the agreement to local laws and conditions. This suggests that, even if the content of PLAs were standardized into sets of alternative language, the discussion, revision, and joint agreement on the language is important to creating the conditions needed for the agreement to be fully successful.

The effectiveness of PLAs in delivering projects on time is due, then, not only to the provisions of the PLA but also to the identification of contractors, union leaders, and workers with the project and its success. The importance of local engagement surfaced numerous times during our interviews with individuals involved in PLAs. When this identification occurs, those involved in the project will seek ways of making the PLA work and often develop informal means of assuring success.

A case example of a 'close success'

On-time completion of a project may require union leaders' active involvement to assure that labor is available when it is needed and that local disputes do not affect work. In most cases, PLAs commit contractors to using members of the local unions that are signatory to the agreement, but they also commit the unions to provide appropriately skilled labor quickly, most often within 48 hours. In addition, the PLAs specify the actions contractors may take when labor is not available. The standard language allows the contractor to hire from any union local that has members available or, in some cases, any other source at all.

A challenge that the building trades can face is assuring that the timeline of the project is not disrupted by local labor issues. Although PLAs are written so that work is not affected by work stoppages consequent to local bargaining, putting this concept into effect can be difficult. Maintaining the contracted work schedule during periods of tension between employers and the trades can challenge the skills and competing responsibilities of local union leaders and employers.

Much of the large-scale construction work in Minneapolis, Minn. is done under PLAs. The professional construction staff of the municipal airport reports that it builds only under PLAs because the agreements mean it can count on timely completion of the work. This is an important consideration for airlines, which build their flight schedules around the facilities' expected completion date.[17]

In the late 1990s, circumstances converged to test the ability of a PLA to assure on-time completion of a major project at the Minneapolis Airport. Construction labor markets were extremely tight in the latter 1990s, and large projects in the Minneapolis area required bringing in "travelers," or workers from locals in other parts of the country.[18] The tight labor market also encouraged jockeying between trades in their negotiations over wages and benefits. The electricians had won a favorable agreement from their contractors, and the members of the pipe trades believed they should do as well, if not better, in their negotiations. The negotiations over a new agreement were difficult, and a seven-week strike took place prior to the final settlement of a new agreement.

Work continued on PLA projects as required by the agreement. However, it slowed as travelers—at the first hint of labor troubles—left the area. Since work was continuing on a number of PLA-covered projects, the loss of the travelers left the local unions struggling to staff jobs, including the airport project.[19] The owner and contractors were, in the end, able to

find sufficient labor by shifting labor from less urgent work to the project. The situation was burdensome and was viewed by the airport authority as not in keeping with the commitments made by the PLA. There were concerns on the part of owner representatives that the local union leadership used the slowdown on the PLA work as leverage in bargaining.

Not surprisingly, these problems drove changes in construction labor relations in the city. Because this "close success" left construction stakeholders, such as the airport authority, vocally dissatisfied with the events around the contract negotiations, the local union and employer association agreed that, in future negotiations, they would submit disputes in negotiations to a joint dispute resolution procedure rather than strike. As a result, relations have improved.

A suggestion that emerged from the airport construction situation was the need for greater involvement by local union officials in the negotiation and implementation of PLAs. The airport construction staff says that in some instances the local union officials with whom they worked were not the same officials who crafted the PLAs, and there was a lack of understanding with regard to the role of the local union and its responsibility to keep the project running smoothly. Subsequently, discussions with local union officials were successful in soliciting greater support for the efficient management of the PLA.

Summary

It is reasonable to conclude that PLAs are most successful, in part, when local union officials and members understand and support the goals of the PLA. Moreover, the union and its members must understand their responsibility as a party to the PLA. The argument is not that national PLAs cannot be successful; rather, it is that local officials need to be involved in the implementation of the national templates. Local engagement is central to gaining the support of the officials who will implement the PLA and to ensuring workers' identification with the project.[20]

Designing PLAs to improve efficiency and encourage innovation

Due to its complexity, temporary nature, and turbulence, the construction industry faces particularly difficult challenges in productivity improvement and in innovation, including the development of new technologies and the introduction of new work practices. These issues appear regularly in professional journals and books on construction.[21] PLAs can be an effective tool for improving productivity and supporting innovation in organization and work structures. The most immediate improvements are provided in provisions concerning the harmonization of work rules between trades, a move that increases efficiency while reducing costs, and provisions that require jurisdictional issues to be addressed prior to the start of a project. PLAs can also be used to experiment with work rule changes, such as minimum staffing requirements or limitations on the use of particular tools and technology.

PLA provisions that change work practices

Each construction trade has work practices that have evolved independently over long periods of time. In the unionized sector, practices such as starting time are usually part of the collective bargaining agreement, but they are most likely based on established past practices. Among nonunion contractors, historic work practices are the unwritten "customs of the trade." Problems and subsequent inefficiencies may arise because of differences between trades. For example, electricians may start work at 7 a.m., while carpenters start at 8 a.m. Pipefitters may have ten holidays, electricians nine, and carpenters eleven. In each situation, the lack of coordination between the trades can create inefficiencies.

PLAs often include provisions to harmonize working hours, workdays, holidays, and starting times across trades. Sections from a New York PLA provide basic language for the harmonization of hours:

> **SECTION 1. WORK WEEK AND WORK DAY**
>
> Eight (8) hours shall constitute a normal workday's work between the hours of 8:00 am and 4:30 pm (with a half hour unpaid lunch break), five days a week, Monday through Friday. The Construction Manager can elect to work the first shift beginning at 7:00 am through 3:30 pm.

SECTION 4. HOLIDAYS

A. Schedule—There shall be 8 recognized holidays on the Project:
   New Years Day
   Labor Day
   Presidents Day
   Veterans Day
   Memorial Day
   Thanksgiving Day
   Fourth of July
   Christmas Day

   All said holidays shall be observed on the dates designated by New York State Law. In the absence of such designation, they shall be observed on the calendar date except those holidays which occur on Sunday shall be observed on the following Monday.

B. Payment—Regular holiday pay, if any, and/or premium pay for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.

C. Exclusivity—No holidays other than those listed in Section 4-A above shall be neither recognized nor observed.

Collectively bargained work rules may not be well-suited to some projects. In such instances, PLAs can be used to change local rules. For example, a local agreement that does not permit a second shift to be scheduled without a first shift may not fit a school project that requires all work to be done after the school day. Similarly, considerable highway work now takes place at night.

Language to accommodate the multiplicity of needs on construction projects can be found in a number of PLAs. The Mt. Vernon (N.Y.) School District PLA states:

> The parties agree that it may be necessary to perform rehabilitation work during periods when school is in session. In that case, the Local Unions agree that the first shift may begin at 4:00 pm and end at 12:30 am (With a ½ hours unpaid lunch period) each day, Monday through Friday.

In some instances, arranging the work week as four 10-hour shifts has advantages over the more traditional eight hours a day, five days a week. PLAs can be used to set aside premium payments required for working more than eight hours a day. A New Jersey PLA states:

> (2) Four Day Work Week: Monday-Thursday; four (4) days per week, ten (10) hours per day plus one-half hour unpaid lunch period each day. The establishment of a four-day workweek will require the prior consent of the Union(s), which represents the affected employees, such consent not to be unreasonably withheld.

Formal and informal work rules exist in all workplaces, construction included. A classic example from construction is bricklayers' informal limitation on the maximum number of bricks laid during a shift. Formal rules may include fixed times for coffee breaks and a minimum number of workers on crews. PLAs can incorporate language that explicitly sets aside particular rules. Because the PLAs are negotiated by union officials and provide gains for workers, provisions for eliminating restrictive practices and work rules are more likely to be effective than unilateral orders to cease such practices. Additional examples of existing PLAs are instructive in the flexibility they offer in the formulation of language that reflects the real conditions of the particular project. An Indiana PLA states:

Section 1. There shall be no limit on production by workers nor restrictions on the full use of tools and equipment. There shall be no restriction, other than may be required by safety regulations, on the number of employees assigned to any crew or to any service.

Section 7. The Union will not impose conditions, which limit or restrict production or limit or restrict the joint or individual working efforts of employees. The Construction Contractor may utilize any method or technique of construction, and there shall be no limitation or restriction regardless of source or location of machinery, precast tools, or other labor-saving devices, nor shall there be any limitation upon choice of materials and design.

The Toyota PLA for San Antonio, Texas states:

Section 1. There shall be no limit on production by workers nor restrictions on the full use of tools or equipment. There shall be no restriction, other than may be required by safety regulations, on the number of employees assigned to any crew or to any service.

The Harvard University PLA initially negotiated by the former U.S. Secretary of Labor John Dunlop is particularly thorough in addressing practices and rules than might reduce project efficiency:

Section 1. No rules, customs, or practices, which limit or restrict productivity or efficiency of the individual and/or joint working efforts of employees shall be permitted or observed. The Contractor may utilize any methods or techniques of construction consistent with the Contractor's agreement(s) with the Owner.

Section 2. Except as otherwise expressly stated in this Agreement and in the Project Contractor's agreement with the Owner, there shall be no limitation or restriction upon the Contractor's choice of materials or design, nor, regardless of source or location, upon the full use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials, tools, or other labor-saving devices. The Contractor may without restriction install or otherwise use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work; provided, however, it is recognized that other personnel having special talents or qualifications may participate in the installation, check-off or testing of specialized or unusual equipment or facilities.

Section 3. It is recognized that the use of new technology, equipment, machinery, tools and/or labor-saving devices and methods of performing work will be initiated by the Contractor from time to time during the Projects. The Unions agree that they will not in any way restrict the implementation of such new devices or work methods. If there is any disagreement between the Contractor and the Unions concerning the manner or implementation of such device or method of work, the implementation shall proceed as directed by the Contractor, and the Unions shall have the right to grieve and/or arbitrate the dispute as set forth in Article VII of this Agreement.

Using PLAs to improve project coordination

There have been great advances in organizational structure in much of the economy over the last 30 years. This is particularly evident in manufacturing, where experiments with socio-technical systems and lean manufacturing have resulted in large changes in work and authority structures. While enumerating these approaches is beyond the scope of this paper,

some of the most important changes have involved the flattening of organizational structures and the greater integration of blue-collar workers in controlling production and decision making about production. These changes have yet to move into construction.

Despite the well-understood challenges and failures of current project management practices—challenges that arise from the organizational and task complexity of construction projects, coupled with a top-down decision structure—there has been little or no change in authority and decision-making structure of construction over decades. The lack of change in the face of these challenges reflects not only a comfort with traditional practices, but also a lack of resources needed to support experimentation of the type undertaken by the larger and better-financed manufacturing sector.

An important element in improving construction work practices is increased involvement of those engaged in the project. The central role of daily labor/management meetings that resulted in reduced injuries in the demolition of the World Trade Center in 2001 and 2002 is one example of the importance of engagement in construction projects. In addition, the use of joint labor/management meetings before the start of a project to resolve jurisdictional issues and consider specific problems are often cited by contractors and union officials as important to the smooth completion of a project because they lead to the prompt resolution of problems.

For example, the Illowa Construction Labor and Management Council (of Illinois and Iowa) has adopted an approach in which it is actively engaged throughout each construction project. If there is a labor issue on a project, the first person to be called is the executive director of the committee. The executive director hears the parties and makes a suggestion about how a dispute might be resolved. If the parties are dissatisfied with the suggested resolution, predesignated representatives are called to the site to hear the issue. This team is empowered to make a binding decision and, after hearing the parties, usually fashions a solution without having to impose a decision. The result of this process is that the owner of the project seldom needs to become involved in disputes. As a result of these outcomes, some PLAs include language establishing ongoing labor/management committees or mandating their role in the construction process at specific times. For instance, Section 8 of the Tappan Zee Bridge (N.Y.) PLA requires:

> **Section 1. SUBJECTS**
>
> The Project Labor Management Committee will meet on a regular basis to: 1) promote harmonious relations among the Contractors and Unions; 2) enhance safety awareness, cost effectiveness and productivity of construction operations; 3) protect the public interests; 4) discuss matters relating to manning and scheduling with safety and productivity as considerations; and 5) review Affirmative Action and equal opportunity matters pertaining to the Project.
>
> **Section 2. COMPOSITION**
>
> The Committee shall be jointly chaired by designees of the President of the NYS Council and the Construction Project Manager, and shall include representatives of the Local Unions and Contractors involved in the issues being discussed. The Committee may conduct business through mutually agreed sub-committees.

The Harvard PLA requires a pre-job conference to address, among other issues, work assignments:

> (a) The Contractor with responsibility for the performance and installation of the work shall make the specific assignment of the work, which is included in its contract, (the "Responsible Contractor"). All work assignments shall be disclosed by the Responsible Contractor (or the Project Contractor, or the responsible Contractor's General Contractor) at a pre-job conference held in accordance with industry practice. Responsible Contractors shall notify the Project Contractor and the affected Unions of the assignment before starting work to be

performed under this Agreement. The Plan for the Settlement of Jurisdictional Disputes in the Construction industry currently in effect, or its successor, shall serve as a guide for establishing jurisdiction at such meetings. Such assignment shall not be changed absent the written agreement of all parties to any dispute arising over such assignment, (including the Responsible Contractor), or pursuant to a decision issued by a permanent arbitrator appointed under this Agreement to hear and decide jurisdictional disputes. Should there be any formal jurisdictional dispute raised, the Project Contractor shall be promptly notified.

Using PLAs to experiment with change

As previously noted, workplaces and workers are governed by a combination of formal and informal rules. The workplace rules developed over time represent the employers and employees' interests in establishing standards of performance. The employees' desire is to create a work environment that is livable and predictable. As the formal and informal rules of the workplace are important to employees, the rules take on a life of their own.

PLAs are temporary agreements, and so they can be used to experiment with altering work rules and allow the workforce to determine how important or unimportant particular rules are. For example, it has been common practice to have project-wide morning and afternoon breaks timed to the arrival of a food and beverage wagon. Because of the time needed for workers to get to the wagon, wait for service, and get back to their work locations, scheduled breaks can reduce working time and productivity. Therefore, some PLAs explicitly eliminate scheduled breaks. Workers still have break time, and may bring food and beverages for the break to their work location, but working time is increased by eliminating the walk to and from a canteen truck and the wait in line.

In creating opportunities to work under different rules, with the assurance that the traditional rules will be maintained as a general framework, PLAs provide experience with alternative work rules. This can result in both improved productivity on the PLA project and, simultaneously, the experience needed to see if taken-for-granted norms are still valued by the workforce and essential to a labor/management relationship.

Using PLAs to change work rules

The discussion and examples of the development of PLA language that has been used to address pay adjustments, harmonization of conditions across trades, and work rule changes reveal four basic categories and reasons for the changes:

- requisite adjustment of the rules to fit a project,
- harmonization of the rules across trades to increase efficiency,
- elimination of rules that may reduce efficiency, or
- changes in compensation such as overtime rates or standards for overtime pay.

Many of the rule changes improve efficiency and reduce costs with little effect on pay or work load. Consequently, although the harmonization of rules benefits some trades while disadvantaging others, the net effect is generally neutral.

The question is, then, why would a particular union sign a PLA that may eliminate positions or reduce pay? One possibility is the quid pro quo for long-term employment on a large project. Just as permanently employed construction maintenance workers, such as those employed by universities, accept lower pay, craft workers on large construction projects who are employed for longer periods of time than those on shorter duration construction projects may also accept lower pay. In recognition of this, some unions may sign PLAs that ease some work rules or reduce premium pay. Likewise, easing the rules to provide cost reductions may induce owners to use a PLA. For a sufficiently large PLA, on balance, the large gains in hours of work justify such concessions.

Summary

Construction projects are complex undertakings that require a high degree of coordination between multiple trades, prime contractors and subcontractors, and managers and owners. Changes in the organization of construction, such as the movement from general contractors to construction managers, increase the challenge to provide successful coordination. PLAs can be used to improve organizational structures and to improve the efficiency of construction projects while lowering injury rates by harmonizing work rules across trades and adapting work rules to the needs of a project. In addition, by mandating activities such as pre-job conferences and regular meetings between the contractors and union representatives, cross-trade coordination can be improved and work issues can be resolved before they affect construction operations.

Designing PLAs to support communities

Governments and private organizations have struggled for more than a century to allow people from disadvantaged backgrounds to move into decent jobs. The federal Manpower programs of the 1960s, the Comprehensive Employment and Training Act programs of the 1970s and 1980s, and others have achieved only partial success. A critical ingredient missing in many of these programs has been the availability of regular employment for trainees. Both private and public training programs have trained people for occupations that did not have the capacity to absorb all new trainees or did not provide the linkages needed to move trainees into private employment.[22]

During the past 15 years, public PLAs have been used to create structures for moving individuals from disadvantaged populations into the construction labor force. Today, a number of PLAs are referred to as Community Workforce Agreements, since they explicitly attempt to engage local populations in PLA-covered projects. Because the construction projects for which PLAs are written tend to be large multiyear projects, they provide the connection between training and employment absent from many training programs. The success of community workforce investment PLAs on West Coast ports has encouraged the incorporation of provisions for social investment into a number of PLAs with public bodies such as the City of Los Angeles and its school district.

The scope and complexity of the community workforce provisions of PLAs varies with the size and duration of construction projects. Even small projects can support training through provisions requiring minimum ratios of apprentices to journeymen and setting aside limits on these ratios in collective bargaining agreements. Larger and longer projects can incorporate more elaborate structures. They can target areas with large disadvantaged populations, improving these populations' ability to qualify for apprenticeship training through pre-apprenticeship programs, requiring that a minimum number of apprentices and workers on the project be drawn from the targeted areas, and providing community involvement in the training and employment process. PLAs may also encourage minority and other small business utilization by exempting them from the provisions of the PLAs and including provisions to encourage them to participate in projects. PLAs used for school construction have engaged high school students and have increased their opportunities to enter apprenticeship programs.

Using PLAs for social investment

PLAs vary substantially in the purpose and sophistication of training provided. Even relatively simple PLAs may address training opportunities by setting aside work for apprentices and other trainees. For example, an Indiana PLA stated that apprentices and non-journeymen may make up "up to forty percent (40%) of a craft's workforce…unless the local collective bargaining agreement establishes a higher percentage." The more elaborate training systems, incorporating the full array of elements (discussed below) for bringing the disadvantaged into the workforce, are found on large public projects. The most extensive of these are related to port construction on the West Coast. The ports of Los Angeles/Long Beach, Oakland, and Seattle each provide extensive systems for social investment through PLAs.

A review of the literature on construction training for those from disadvantaged backgrounds suggests that six elements are needed for success: (1) a pre-apprenticeship program, which provides foundation skills and screens enrollees for their ability to handle the demands of construction; (2) a link from the pre-apprenticeship program to apprenticeship opportunities that provides reasonable assurance that those who complete the pre-apprenticeship program successfully will be enrolled in apprenticeships; (3) sufficient apprentice work opportunities so that those who are enrolled in the apprenticeship programs will complete those programs in a reasonable time; (4) continuing work opportunities that allow apprentices to readily move into journeyman status and move forward with their work lives; (5) oversight by representatives of stakeholders in the training and the project and the development of institutions that allow issues to be resolved without disrupting the training (stakeholders include the community from which the target population is drawn, the employers and locals that are party to the PLA, and the owner); and (6) development of close working relationships from the beginning between community groups and advocates and local building trades unions and councils in the development, crafting, implementation, and ongoing evaluation of these efforts.

These elements are not always easy for the stakeholders in such programs to agree to. Items 2 and 5 can be sensitive for the labor and contractor parties to PLAs, as these create additional oversight for apprenticeship programs. The final item, development of close working relationships between community groups and local building trades, is particularly important to the success of these projects. Conflict between the trades and community groups has occurred when members of communities have viewed the unions as standing between them and good jobs. Similarly, unions and contractors have viewed community groups as naïve about the requirements of construction. Early and ongoing communication between local union leadership, contract associations, and community groups is important to the success of these efforts. Communication is necessary to promote the understanding needed to resolve the differences between the perspectives of the two parties and to fashion workable solutions to the difficulties involved in moving disadvantaged groups into better jobs while protecting established work and skill standards.

A case study: the Port of Oakland PLA

The incorporation of social investment language into the Port of Oakland PLA during the negotiation of the agreement in 1999 reflects the previously limited success in bringing less-advantaged populations and minority-owned businesses into several large-scale, public construction programs (Sloan et al. 2001).

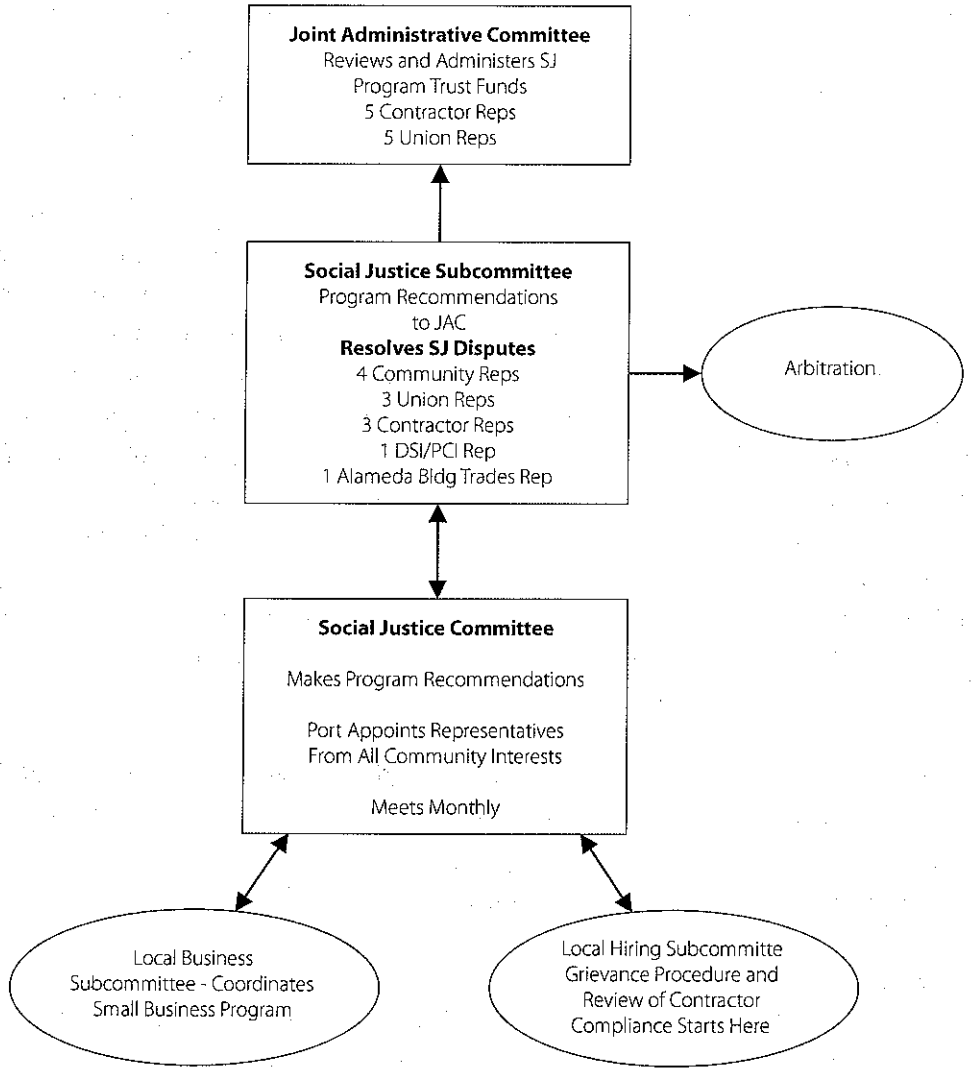
The Port of Oakland PLA included three goals with respect to disadvantaged populations: (1) the Port's commitment to existing community programs such as its Non-Discrimination and Local Small Business Utilization Program; (2) an effort to engage local firms, which historically had been excluded from large projects in favor of out-of-town contractors; and (3) an effort to involve disadvantaged residents, who had historically been excluded from both union and nonunion jobs on projects. A carve-out program for small businesses and a program to bring local residents from targeted areas into apprenticeship programs addressed these issues.

The carve-out program allowed up to $15 million of the value of the contract covered by the PLA to be excluded from the requirements of the PLA. The contracts covered by this program had to be less than $300,000 in value. Alternatively, a contractor's aggregate contractual value had to remain less than $300,000 to remain exempt from the PLA. In turn, unions agreed to refrain from work stoppages against these contractors. They also agreed that they would not take action against contractors on the Port of Oakland PLA for issues, such as nonpayment to benefit funds, that originated on work not covered by the Port of Oakland PLA.

The targeted construction labor force populations were geographically structured with a hiring requirement keyed to the local impact area (LIA) of the Port of Oakland. The LIA, which includes census tracts with 50% or more of the local population living below the poverty level, included Alameda, Emeryville, Oakland, and San Leandro. The PLA required that residents of the LIA perform 50% of labor hours on a craft-by-craft basis. In the event that there were not

FIGURE A

Port of Oakland PLA Social Justice Program



SOURCE: Johnston-Dodds (2001).

a sufficient number of workers living in the LIA to meet this requirement, the labor hours could be made up by residents of Alameda and Contra Costa counties.

The administration of the social investment terms was overseen by three committees: the Social Justice Committee (comprising community representatives appointed by the port), the Joint Administrative Committee (five union and five contractor representatives), and the Social Justice Subcommittee (four community representatives, three union members, three contractors, one Building Trades representative, and one port representative). A diagram reflecting the committee composition is shown in **Figure A**.

The roles of the Social Justice Committee included: (1) a review of monthly reports on social justice programs; (2) program and funding recommendations to further social justice goals of the PLA; (3) oversight of contractor compliance;

(4) referral of complaints about social justice violations to the social justice subcommittee of the joint administrative committee of the PLA; and (5) collaboration with the workforce development agencies to provide services to support workforce development efforts such as pre-apprenticeship programs. The social justice activities were supported by a $0.15 per craft hour contribution up to $1 million.

As the diagram shows, the structure of the social justice program links the Social Justice Committee and the Joint Administrative Committee, which oversees the funds produced by the hourly contribution, through the Social Justice Subcommittee. This creates a means for the stakeholders[23] in the social justice program to discuss issues and develop solutions without involving the community stakeholders or port in the administration of the apprenticeship program or contributed funds.

A critical issue in moving the social justice goals of the PLA has been to prepare prospective residents of the LIA for apprenticeships. Although almost 500 residents of the LIA had entered apprenticeship programs by mid-2001, the numbers of local hires and apprentices were considerably below the local hiring and apprenticeship goals. To address these needs effectively, the Bay Area Construction Sector Intervention Collaborative (BACSIC), a collaboration of community groups and the building trades, formed to provide basic construction skills and establish a central training site in Oakland. BACSIC provided fundamental educational and remedial resources, including "soft skills" development training in areas such as dependability, attendance, communication, and problem-solving; on-site pre-apprenticeship and trade-certified apprenticeship training; employer-based job training; on- and off-site supportive services (life skills training, housing, child care, transportation assistance, primary health care, mental health and substance abuse services, and domestic violence services); and job linkage services.

While issues remained for this particular PLA, it was more successful in meeting the social investment needs of the community than prior large public works projects and provided a foundation for the social investment provisions of other West Coast PLAs.

A case study: The Los Angeles Community Redevelopment Agency PLAs

In March 2008, the Los Angeles Community Redevelopment Agency adopted a policy that requires construction projects receiving a threshold level of subsidy to be completed under PLAs with provisions for the hiring of local and disadvantaged workers. The Los Angeles Community College District (LACCD), the Los Angeles Unified School District (LAUSD), and the City of Los Angeles each signed a PLA incorporating provisions required by the redevelopment agency.

Both the community college district and the school district had prior experience with PLAs and had incorporated pre-apprenticeship programs into them. Although provisions vary between these PLAs, each incorporates requirements or goals for the hiring of local residents from low-income areas as apprentices and for the employment of "at risk" former offenders and youths. The community college PLA covers $1.1 billion in construction; the city contracts $382 million. While the projects being built under these PLAs are ongoing, early results indicate a favorable effect on hiring targeted populations. A report from the UCLA Labor Center (2009) on the community workforce provisions of PLAs negotiated under the guidelines of the redevelopment agency reached nine conclusions:

1. Local hiring provisions in PLAs significantly increased the number of local hires. We base this on a comparison between one Los Angeles City project for which local hiring PLA provisions were not thoroughly applied and four similar projects for which these provisions were applied and followed.
2. Local hiring goals of 30 percent were met and exceeded on all three PLAs. In fact, local hires—including apprentices and, under some agreements, disadvantaged workers—typically were about 35 percent of all hires.

3. Compliance should be measured on a project-by-project basis. In our case studies, local hiring goals were applied to the specific building project as a whole, allowing some subcontractors to exceed local hiring goals and some subcontractors to fall short.

4. Large subcontractors and general contractors disproportionately assumed responsibility for meeting local apprentice and journey worker hiring goals. In analyzing Los Angeles City projects, we found that small subcontractors tended to have a lower percentage of local apprentices and local journey workers than did larger subcontractors and general contractors.

5. Apprentices on new construction came on the job later than journey workers. Construction projects have a ramp-up period followed by full construction and then a finishing-off period. Early in a project's lifecycle, contractors met local journey worker hiring goals, but not those for apprentices or local apprentices. Later, as the project hit its stride, apprentice and local apprentice goals under the PLAs tended to be met.

6. Contractors improved their local hiring attainments as they gained additional experience. Our analysis of LAUSD data concluded this to be true for LAUSD projects.

7. On LAUSD contracts, contractors on moderately paced contracts met local hiring goals more easily than did contractors on fast-tracked LAUSD projects.

8. Forty-one percent of apprentices, 39 percent of journey workers, and 23 percent of foremen on LAUSD projects were local hires. This suggests that contractors emphasized hiring local apprentices, a significant finding because one of the goals of local hiring is to encourage the entrance of local workers into the construction trades through apprenticeships.

9. The success of local hiring goals depends on the size of the local area from which hires will be sought. In the case of the LACCD, two local areas were defined: a small area that included only the zip code in which the project was being constructed, and a larger area that consisted of the overall LACC district. The nine LACCD projects we studied all met or exceeded the 30 percent local hiring goal established by the PLA. Typically, only about 5 points of these 30 percentage points came from the narrow definition of "local"—that is, the zip code area in which the project was being constructed. The remaining 25 percentage points typically came from the larger local area.

Both the Port of Oakland and the Los Angeles PLAs required extensive initial negotiation, complex institutional structures, and ongoing discussions between the stakeholders to keep the programs on track. It is doubtful that such an agreement or program would be possible absent unions and signatory contractors and the use of PLAs. The nonunion contractors lack the institutional structure needed to negotiate and oversee agreements that accomplish the ends of the Port of Oakland and Los Angeles PLAs. Nonunion training programs are generally not sufficiently developed to meet the training requirements of these programs. There is no obvious means for nonunion contractors to obtain the assent of the existing workforce to the substantial changes required by these agreements. Finally, while unions and signatory employers have hiring rules that provide a relatively structured and transparent system by which trainees can obtain employment once their apprenticeship is completed, there is considerably less assurance that trainees will be provided fair access to employment once a project is completed.

Using school PLAs to develop the construction labor force

It has not always been easy for the construction industry to recruit good high school students into apprenticeship programs. The best high school students are pointed toward college, and construction suffers from the perception—which is not completely untrue—that it is a difficult, dirty, dangerous, and cyclical industry. Nonetheless, construction needs

young people who have the work ethic and general skills to succeed in the industry. As Michael Crawford, in his recent best-seller *Shop Class as Soul Craft*, points out, skilled manual work requires a sophisticated understanding of physical systems and an ability to integrate this knowledge into action that produces the desired result in an efficient manner. Exposure to construction work has the potential to attract excellent students who would otherwise follow the college track. Exposure to this type of work might also persuade more high school counselors and teachers that skilled construction training provides a satisfactory alternative to college for students who are so inclined, even if they have the ability to succeed in college.

The San Jose Construction Academy

School PLAs have been used to provide high school students with construction experience and establish ongoing construction training programs for both blue-collar trades and white-collar professions. An example can be found in San Jose, Calif. In March 2002, voters in San Jose's East Side Union High School District approved a $300 million bond issue to be used for school construction and renovation. Virtually every high school in the district was to undergo comprehensive renovations, and several new facilities—such as adult learning centers, a gymnasium, and even a cable television and radio studio—were to be built at some of the schools. Although some work had already taken place, in 2004 the district entered into a PLA with the Santa Clara and San Benito Counties Building and Construction Trades Council.

The district decided on a PLA, in large part, because it saw the agreement as a mechanism to expand its vocational education programs into both the blue- and white-collar construction occupations. The district has a well-established vocational education program that is part of its career services approach to education. The East Side already had several vocational academies operating, and the district viewed the PLA as a means to establish a program in construction occupations. The novelty of the East Side PLA, and the sweetener that led to its signing, was a provision connecting work under the PLA with the establishment of a Construction Technology Academy that would offer pre-apprenticeship training, summer internships, and work in both the trades and white-collar construction occupations.

Thus, the East Side PLA is innovative in several ways. First, it is an example of a new form of PLA that attempts to find new areas of win-win in construction collective bargaining by bringing a new player to the table, the owner—in this case local school administrators and elected members of the school board. Second, it is an effort to recruit high school students into the construction industry through an institutionalized mechanism in order to better compete with other industries for talented labor. This aspect of the agreement directly addresses training problems posed by the retirement of the baby boom generation. Third, it is an effort to solve a school district's problem of creating meaningful education for those not bound for college, an education that provides the student with an awareness of possibilities, prepares the student appropriately for the demands of the labor market, gives the student experiences that will qualify him or her for advancement, and allows the student in this case to "test drive" a full range of blue- and white-collar opportunities within an entire industry. Finally, by requiring participating contractors to provide employment, through the auspices of the PLA, this particular institutionalization of a journey from school to work seeks to overcome the weakness of previous similar experiments by putting students to work rather than on job lists. Certainly, like other PLAs, this agreement was motivated by traditional concerns for work and the conditions of work on the part of unions and by the need to develop an adequate supply of skilled and qualified labor on the part of construction owners. However, these traditional motivations were not paramount. The novel and experimental motivations listed above were the fundamental reasons this PLA was signed. An appendix to the PLA contains the essential elements of the plan:

> The Parties have agreed to create a Construction Technology Academy ("Academy"), funded by the District, to carry out the training and employment objectives of Appendix B. The overall objectives are to (a) offer opportunities and skills necessary to enter post-secondary study [including construction apprenticeship programs as well

as college education] and to pursue lifelong learning within the broader context of the building trades industry and (b) develop and reinforce academic course content standards in order to maximize career opportunities and technical competency.

Sub-provision (b) recognizes that schools would do a better job if the school curriculum were tied more closely to industry needs and directions. In construction, unions as well as contractors pay close attention to technological trends and customer demands. Thus, connecting the school's curriculum to the knowledge held by contractors, unions, and joint apprenticeship boards was seen as an effective method of tying industry directions to the school curriculum in the case of construction. A 16-member steering committee was created by the PLA to oversee the academy. Membership on the committee includes representatives of the joint apprentice training councils, the building trades council, and the school district. In addition to the creation of a steering committee, which binds the school district, the PLA requires the unions and the joint apprenticeship training councils and contractors to give preferential consideration for admission to apprenticeship programs to graduates of the academy. The goals of the PLA are for students to obtain actual work as interns and then as apprentices. This is accomplished by placing 30 interns per year in a five-week rotation among the trades. First, students are taught about estimation, engineering, and legal aspects of construction. Then students are given internships, which take place when school is out and construction activity is at its peak. The internship program also qualifies as a pre-apprenticeship program, gives students priority for entering union apprenticeship programs, and provides a point of entry for a number of minority students into union employment. Even if a student does not become an apprentice, he or she has the opportunity to enter the workforce as a material handler or in another unskilled position.

More than five years of experience with the construction academy suggest that this model for providing training and work experience to high school students works. The academy has been successful in giving students a broad experience across a number of trades and placing some graduates in apprenticeships, while others have chosen to attend college. Despite the current state of the construction economy in California, the academy continues to offer outstanding training in construction and has provided a model for high schools throughout California. Experience with the academy also provided the experience and energy for the Building Trades to establish a summer program for K-8 science and math teachers to be exposed to the construction industry and develop curricula that incorporate material from the industry into their teaching. To some degree this involvement promotes the industry, but it also provides an immediacy and relevance in the curriculum that enhances students' interest.[24]

Using PLAs to create journeys from school to work in construction is a work in progress. However, the unions are helping with the creation of a solid pre-apprenticeship program that will enhance the students' ability to qualify for apprenticeships after graduation. A key and unique provision of the San Jose PLA was its requirement for internships, combined with language that ensured graduating students would get jobs either as apprentices or as material handlers. A major hurdle facing the union construction industry has been, in the view of one union leader, the lack of a means to move younger workers into the union workforce in the face of apprenticeship admissions standards and regulations that require nondiscrimination and fair access to these programs. The solution was the proviso in the PLA that requires participating contractors to provide graduating students with jobs, either as construction apprentices or as material handlers. This requirement means that students at least transition to non-craft material-handling jobs or qualify as experienced applicants to apprenticeship programs.

Experiments of this type are not limited to San Jose. A recent PLA in Buffalo, N.Y., also focused on school construction, provides another example of a pre-apprenticeship program provided to vocational high school students. The PLA maintains that the students "shall perform 'hands-on' work in the trades."[25]

Research provided training for more than 2,000 workers who spent time on the site. Finally, a structure that involved all of the parties engaged in the demolition was established to monitor and address safety issues: Grabelsky writes:

> A two-tiered health and safety committee (LMHSC) involving both labor and management representatives were established to quickly identify and correct safety hazards. A Leadership Oversight Committee comprised of the chief elected union officials, key staff from the site contactors, as well as representatives of employer associations, OSHA, and the Department of Design and Construction of New York City. A site committee—comprised of union stewards and operations and safety staff, contractors and agencies—met once a week. The meeting was followed by a walk-through of the site by committee representatives to identify hazards and ensure they were immediately corrected. The committee produced a weekly Safety Bulletin that was widely distributed through a network of union stewards who met every week to identify safety hazards, propose safety interventions, and review health and safety issues for daily tool box talks with their members. OSHA sampling result summaries were also distributed and discussed weekly at these meetings, and again monthly with the Leadership Committee. (Grabelsky n.d., 6)

This joint structure required extensive communication between agencies, organizations, and individuals who do not typically work with one another on a project. The marked success of this effort is reflected in a lack of fatalities and the low incidence of lost-time injuries—an incidence that was well below construction industry standards. It points strongly to the importance of sharing of responsibility and authority on safety matters, and integrating the full workforce into the safety effort. Although the WTC demolition was not conducted under a PLA, the success of this project points toward the type of provisions needed in a PLA to improve safety performance.

The current state of safety and health provisions of PLAs

The majority of PLAs codify but do not alter existing safety programs. PLAs generally specify that the construction manager must establish a set of worksite safety rules in consultation with either a general labor/management committee or a safety-specific labor/management committee. Provisions related to drug and alcohol testing may be specifically included in a PLA. The PLA may also include a provision to adopt safety practices necessary as part of an Owner Controlled Insurance Program (OCIP), sometimes referred to as wrap-up insurance. In addition, provisions for emergency work across trade lines in the event of accident, fire, or "act of God" often appear in PLAs, although not necessarily in the health and safety section of the agreement. In short, health and safety language in PLAs can range from perfunctory to very detailed. Often, if a PLA has perfunctory language it is because there is a highly detailed health and safety program, which may include drug testing, in a separate document.

An example of safety language from the Rockland County, N.Y. Courthouse PLA states:

> **ARTICLE XIV – SAFETY PROTECTION OF PERSON AND PROPERTY**
>
> **SECTION 1. SAFETY REQUIREMENTS**
>
> Each Contractor will ensure that applicable OSHA requirements are at all times maintained on the Project and the employees and Unions agree to cooperate fully in these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of the Contractor and Authority from injury or harm. Failure to do so will be grounds for discipline, including discharge.

SECTION 2. CONTRACTOR RULES

> Employees covered by this Agreement shall at all times be bound by the safety, security and visitor rules as established by the Contractors and the Construction Manager for this Project. Such rules will be published and posted in conspicuous places throughout the Project.

Even this simple language improves on the baseline protections provided in the Occupational Safety and Health Act by making OSHA requirements enforceable under the dispute resolution procedures of the PLA and by establishing some common practices across contractors.

A case study: the safety success of the Boston Harbor Project

The Boston Harbor cleanup project, conducted between 1986 and 2001, involved 23 million hours of craft labor over the course of 15 years and expenditures of $3.6 billion. The lost-time incident rate was 4.1%, compared to a national average for heavy construction of 6.2% (Dunlop 2002; Armstrong and Wallace 2001). Further, the lost-workday incident rate was 134.7% for Boston Harbor versus a national heavy construction rate of 150.4%.[32] Later analysis indicated that the lost time incident rate was 40% below the heavy construction average for the 36 million exposure hours on the project (Armstrong and Wallace 2001, 15). Paralleling the World Trade Center, the success of the Boston Harbor Project in reducing injuries reflects both a serious dedication to worker safety and the embodiment of this dedication in contractual structures to provide a safe workplace. Different, however, from the World Trade Center project was the geographical scope and duration of the Boston Harbor Project, which make the project's success even more impressive.[33]

In contrast to many construction operations, the stakeholders in the Boston Harbor Project agreed that safety took priority over production and that potentially unsafe operations would be shut down until safety matters were resolved. The labor/management committees created under the PLA provided the means to create an ongoing awareness of safety among the workforce. They intentionally made information about safety matters available to stakeholder representatives; they conducted regular tripartite meetings to discuss safety issues and acted on the joint decisions; and they delivered safety decisions and information to the workforce. Craft workers met each week to discuss safety information disseminated by the project labor/management committee, and the conditions and practices that might affect the safety of their work. Information from these meetings was forwarded by stewards to the project labor/management committee for discussion and action. Regular labor/management meetings reviewed all safety incidents and information on safety matters forwarded from the craft worker meetings. The discussions were recorded and the decisions of this committee were quickly implemented. While Boston Harbor's strong record with respect to safety can be attributed to dedication of the stakeholders, structures created by the PLA were critical in turning this dedication into effective action. Similarly, programs have been adopted by other large projects built under PLAs in the Boston area, including the Central Artery Tunnel project (the "Big Dig") and the Logan Airport expansion. Not surprisingly, both had excellent records with respect to safety and health.

Safety provisions of other PLAs

Another example of a PLA that creates structures to improve project safety is found in a Washington PLA, part of which is reproduced here:

> 16.1 The parties to the agreement will participate in the Voluntary Protection Program....In the VPP, management, labor, and government establish a cooperative relationship at the workplace to address worker safety and health issues and expand worker protection....

16.2 The parties to this agreement will form a joint Labor/Management Safety Committee consisting of equal numbers of contractor and Union representatives, to be agreed upon by the parties, which shall be jointly chaired by the site representative of [the construction manager] and an official of the Building and Construction Trades Council....

16.3 The [construction management] team will develop a Project Safety Committee of contractors' employee representatives to address issues pertinent to activities onsite, plan and discuss future project work and review the current health and safety plan and procedures....

16.4 Formal safety and health training is required of all contractors for their employees....

16.5 It shall be the responsibility of each Contractor to ensure safe working conditions and employee compliance with any safety rules contained herein or established by the Owner, [construction manager], or the Contractor.

16.6 Employees shall be bound by the safety, security, and visitor rules and environmental compliance requirements established by the Contractor, [the construction manager], or the Owner....

16.7 The use, sale, transfer, purchase and/or possession of a controlled substance, and/or alcohol while on the Owner's premises at any time during the workday are prohibited. Contractors will implement a drug policy meeting [the construction management firm's] minimum standards for Drug-Free Workplace Program separately attached under Appendix D. [The construction manager] may conduct reasonable searches, as permitted under the law, including random searches, of all workers on site and may require and receive the results of a 7-panel drug screen test of any worker on site. Any worker found to possess or be under the influence of an article prohibited by the Standards, or refusing to be tested or consent to a reasonable search may, in [the construction manager's] sole discretion, be immediately removed from the project site and denied future access....

16.8 These procedures outline the safeguards set forth for the testing of employees for prohibited and controlled substance, adulterants, and alcohol. It is agreed, with respect to such test procedures, that: (i) no person referred from the Union hiring hall shall be allowed on-site as an employee until such person has completed and passed any test(s) required under the program; (ii) a person who is put to work immediately after having passed the tests shall be paid starting at the time he reported for the test(s); and (iii) where a contractor requests a person to report for purposes of pre-employment substance abuse and alcohol test, and does not intend to place him in an active work position on that day, the person shall receive four (4) hours or pay at the regular straight-time hourly rate if the test is negative.

16.9 The authorized [sic] use or possession of firearms, weapons, explosives, or incendiary material on or near the Project premises...is prohibited....

16.10 The parties acknowledge that the environmental and safety restrictions governing conduct at the Project site prohibit smoking at any time in any facility....

16.15 Violators of the [program] will be subject to termination for cause with the same conditions for rehire as established in Article IX [referral provisions].

As the Boston Harbor PLA and World Trade Center agreements demonstrate, the agreements have the potential to improve project safety. Concretely, the agreements can mandate safety programs and standards and establish structures in keeping with the five steps needed to improve safety. Realizing this potential requires that the parties to PLAs value safety and be willing to create the structures needed to provide it.

Potential cost savings through safety provisions in PLAs

The safety improvements established by PLAs can also serve to reduce project costs and improve the performance of the workers' compensation system. In mandating a single shared safety program, PLAs overcome the problem of coordinating the multiple safety programs that exist on most sites. Thereby, the consolidation of safety programs reduces costs. For example the Eastside Reservoir construction project in California, a $2 billion project begun in 1994 that required two dams and created a four-and-a-half-mile lake, utilized a PLA that allowed the parties to consolidate over 250 safety programs conducted by over 250 subcontractors and 20 general contractors. According to a representative of the project owner, the Metropolitan Water District of Southern California, this resulted in a savings of $30 million in insurance costs (Plemon 2004).

PLAs may also be used to improve worker performance and sometimes reduce costs. A number of states now allow for workers' compensation "carve-outs," the creation of a project- or industry-specific workers' compensation system that allows the use of alternative dispute resolution (ADR) systems, in place of litigation, for the resolution of conflicts. The use of ADR holds out the possibility of swifter and less-costly dispute resolution over workers' compensation cases. Early research by the California Division of Workers' Compensation (1996 & 1997) suggested that carve-outs reduced litigation, returned workers to work more rapidly, and reduced the cost of workers' compensation. A more recent and nuanced study, *Carve-outs in Workers' Compensation: An Analysis of the Experience in the California Construction Industry* (Levine et al. 2002) found that use of such systems improved injured workers' situations with regard to resolution of disputes but did not have a systematic effect on costs. The carve-outs remain an option that can be created through PLAs when the parties believe they would serve to improve performance of the workers' compensation system.

Summary

Safety remains a serious problem on many construction sites, where fatalities remain a reliable metric of the lack of adequate precautions. A number of steps can be taken to improve construction safety, but for reasons having to do with industry structure, culture, and knowledge, these steps are not implemented on most sites. PLAs offer a means of improving health and safety by establishing the structures that have been demonstrated to improve safety performance on construction sites.

Designing PLAs to resolve disputes

Labor disputes in construction are much less common today than they were 30 years ago, when the sector accounted for 5% of employment but a quarter of all strikes (Mills 1980). Nonetheless, the potential for work disruptions remains, and it deserves the attention of unions, contractors, and owners.

The importance of the issue was highlighted by the July 2005 Construction Users Roundtable's *Tripartite Initiative Report: Eliminating Work Disruptions and Jurisdictional Disputes.* Many of the recommendations in the report could be handled by a PLA and, in fact, a number of them are typically found in PLAs, including:

- Mandatory "pre-bid" conferences to "identify possible challenges of a particular project (jurisdictional assignments, jobsite issues, working conditions, sequence of work, schedules, etc.)."
- A requirement that employees sign a statement "acknowledging that work disruptions on the project are prohibited and that violators will not be eligible to re-employment...(an expedited grievance procedure should be available...)."
- Mandatory "pre-job" conferences for all contractors and subcontractors; "[a]dopt uniform pre-job procedures for all contractors and subcontractors on a project that require them to identify manpower requirements and proposed jurisdictional assignments."

workers and sheet metal workers, in deference to their bipartite panels. A Connecticut agreement is completely silent concerning grievances and arbitration; one would assume that the parties turn to local procedures.

In most cases, the terminal step of the grievance procedure is a decision by a single arbitrator who is named in the agreement, chosen by American Arbitration Association or Federal Mediation and Conciliation Service procedures or referred by a state agency. In two cases the PLAs provide for a tripartite arbitration panel. A Pennsylvania PLA—unique among those we reviewed—states that a three-member arbitration panel shall include a union representative, a contractor representative, and a representative of the property owner. A PLA in Washington State specifically states that all prevailing wage disputes shall be referred to the director of the Washington Department of Labor and Industries.

A number of PLAs limit the arbitrator to awarding no more than 60 days of back pay. A typical clause requires the property owner, construction manager, or general contractor to be apprised of any grievance actions involving subcontractors.

Jurisdictional disputes

Every PLA reviewed makes some mention of jurisdictional matters being handled through the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry. The model PLA includes four sections on jurisdictional disputes; they direct that (1) work assignments are the contractor's responsibility and should be made in accordance with the plan (i.e., any past decisions or agreements); (2) if disputes arise they should be decided through plan procedures; (3) no job actions should occur over such disputes, and any individuals ceasing work are "subject to immediate discharge," and (4) contractors must conduct pre-job conferences, presumably to head off jurisdictional disputes.

Language in the scope-of-agreement clause may also be used to forestall jurisdictional disputes. This is done by stating which work and which employees are not covered by the agreement. For example, manufacturers' employees may be allowed to install certain equipment on a site without falling under the jurisdiction of the PLA.

A Washington PLA requires that each contractor and subcontractor develop a work assignment document 14 days before beginning any work. Competing unions may present evidence for their claims at a pre-job conference, and then have seven days to respond to any decisions of the contractor. Only after the local procedure is exhausted are disputes referred to the plan. An Ohio PLA allows for an arbitrator's decision if a dispute before the plan is not settled in 15 days.

A few PLAs contain language to handle jurisdictional disputes involving non-BCTD unions and/or employers who have not agreed to be covered by the plan. A Massachusetts PLA, for example, places such disputes before an arbitrator who has 14 days to hold a hearing and render a decision. The agreement specifically states that the arbitrator cannot assign work to a double crew, but may create a composite crew.[35] Nearly identical language is included in a New York and a Nevada PLA.

Summary

One of the more important purposes of a PLA is to assure that a project is as free of work disruptions as possible. PLAs accomplish this goal through broad no-strike language, fast and harsh penalties for violations of such clauses, the use of grievance and arbitration procedures to handle most problems, and highly developed methods to handle jurisdictional issues, such as pre-job conferences, detailed work assignment language, and methods for neutral settlement.

This brings us to the question of whether PLAs have, in fact, been successful in resolving disputes before work is disrupted. This is a difficult question to answer, since good data on work disruptions are scant and no database indicates whether a disruption has occurred on a project covered by a PLA. Based on analysis of the Lexis/Nexis database of newspaper and wire reports, approximately 50 strikes that have been significant enough to gain press attention have occurred around the country in construction during the past 10 years (including one involving nonunion ironworkers). These press reports mention four work stoppages that occurred despite a PLA, including three in the San Francisco area in 1999 and 2000 and one in Providence, R.I. in 1999. The latter involved picketing by rank-and-file union members

who were unaware of the no-strike provisions of a PLA; the picketing resulted in a nonunion firm leaving a worksite. The matter was resolved in one day.

The Lexis/Nexis database does not include any press reports after 2000 specifically concerning work disruptions on PLA-covered sites. There are a number of reports, however, which note work continuing on PLA projects despite strikes by area construction unions. For example, in May 2009, *The Plain Dealer* of Cleveland, Ohio reported on a Laborers Union strike in northeastern Ohio, but noted that "Local 310 members on several larger projects, including those at the Cleveland Clinic and University Hospitals, remain on the job because the union has project labor agreements prohibiting strikes or other job actions" (May 7, 2009, C2). Similarly, the *PR Newswire* reported in the spring of 2006 that a Laborers Union strike against over 200 employers in the Chicago area "is expected to affect most construction projects in Cook, Lake, DuPage, Will, Grundy, Kendall, Kane, McHenry and Boone Counties except for public works projects that are covered under multi-union project labor agreements." A *St. Paul Pioneer Press* article on a 2004 Ironworkers' strike in Minnesota noted, "Aside from bridge work, ironworkers also are crucial in the construction of commercial buildings. But most large commercial buildings are covered by so-called 'project labor agreements,' which prohibit walkouts by all construction unions" (May 28, 2004, C1). An Associated Press report of a 2002 carpenters strike in Connecticut pointed out that, "Striking carpenters were scheduled to meet Wednesday at 6:30 a.m. at their local union halls before fanning out to job sites across the state to picket. The strike will not affect construction jobs that have project labor agreements." In 2001, a *Boston Herald* report on a Sheetmetal Workers strike stated that, "The sheet metal workers on some high-profile jobs covered by project labor agreements are legally barred from walking off the jobs" (August 2, 2001, 33). The *St. Paul Pioneer Press,* reporting on a strike by six unions in 2001, noted, "But work on large construction projects—office towers and the like—shouldn't be affected by a work stoppage. That's because most major projects are covered by separate project labor agreements" (May 8, 2001, C3).

More research is needed to determine whether PLAs are effective dispute settlement tools. Such research should examine not only differences between projects covered by PLAs and those that are not, but also consider whether particular language or practices under differently worded PLAs afford better protections against work disruptions.[36] Until then, we must rely on press reports and other anecdotal evidence, which, to date, suggest that PLAs have generally been successful in preventing work disruptions.

Designing PLAs to deal with nonunion contractors

As discussed at the beginning of this report, the controversy over the use of PLAs on public projects accelerated with the growth of the nonunion sector in the construction industry. At one time, there were very few nonunion firms large enough to compete for work that would likely be covered by a PLA. That is no longer the case. Today, nonunion firms are able to compete for nearly all forms of construction work in nearly all parts of the country. In addition, as PLAs have come into more frequent use, they have been applied to smaller projects. While an atomic energy facility may have been the typical PLA project of the 1950s, today a local high school is just as likely to be built under a PLA.

PLAs affect both union and nonunion contractors. In assenting to a PLA, contractors agree to abide by collectively bargained terms and conditions. For union contractors, the major change is working under the somewhat different rules that might be called for by the PLA. But for the nonunion contractor, working on a PLA can be a substantial departure from normal operations. For one thing, meeting the terms and conditions of the local collective bargaining agreement often results in the contractor paying considerably higher wages and benefits. Higher wages and benefits can be a particular problem for nonunion contractors who use relatively large numbers of semi-skilled workers rather than follow the union model of smaller numbers of highly skilled workers. The lower productivity of semi-skilled workers is economical if they can be paid relatively low wages, but the arrangement may not be workable at union rates. Depending on the terms of the PLA, nonunion contractors may be required to hire some or all of their employees from a union hall. Differences in work rules regarding time keeping, persons allowed to do various types of work, and time off may

also make working under union rules challenging. Nonunion contractors may also be required to pay into funds to support apprenticeship training, safety programs, and other institutions common to organized employers.[37] A common complaint is that nonunion contractors may have to pay into both their firms' pension and health funds and into union programs, but evidence of double payments is scarce.[38]

Participation on PLA projects by nonunion firms

Nonunion contractors and their associations often call PLAs "union-only" projects. While most PLAs, including all public sector PLAs, allow participation by all qualified firms, the real question is whether the requirements of PLAs in effect preclude nonunion contractors from bidding or from operating successfully under the terms of the PLA. For example, a requirement that a nonunion contractor sign the local collective bargaining agreement for all of its work, whether covered by the PLA or not, would likely discourage most nonunion contractors from bidding. There has, however, been a tendency for nonunion contractors to treat projects under PLAs as union-only even when the agreement was written to allow open shop contractors to participate.

Language in PLAs can be more or less favorable toward nonunion participation, making it simpler or more complex for nonunion contractors to participate in a project. In some PLAs, nonunion contractors are required to use union referral systems, such as hiring halls, exclusively; in others they are able to bring part or all of their existing labor force onto a project. Similarly, some PLAs require contractors to sign the local collective agreement and become union contractors; others require only a letter of assent (i.e., an agreement to abide by the PLA) and do not require signing the local agreement. Decisions about the terms under which nonunion firms may participate in a project covered by a PLA are, in the end, part of the negotiation between the construction manager and the local building trades organization, subject to the applicable laws and regulations. These decisions affect the ease with which nonunion contractors can bid on a project and hence the willingness of such contractors to participate.

PLA openness to nonunion participation involves six issues: (1) whether nonunion contractors can bid on PLA work and whether the owner can accept their bid; (2) what the nonunion contractor is required to do with respect to the local collective agreement; (3) how the nonunion contractor obtains its labor force; (4) whether nonunion workers are required to join the union; (5) how nonunion workers are provided benefits and how benefit costs will be handled to assure the nonunion and union contractors a level playing field; and (6) how small and minority contractors can participate in a project covered by a PLA. Another issue is why unions and union contractors would negotiate a PLA that allows nonunion participation.

Can nonunion contractors bid on PLA work and can the owner select that contractor?

Today, all public and many private PLAs explicitly allow any contractors to bid on a project without respect to their union status. For example, Toyota's 2003 San Antonio, Texas PLA states:

> TMMTX and/or the Construction Contractor(s) have the absolute right to select any qualified, bidder for the award of contracts on this Project without reference to the existence or non-existence of any agreements between such bidder and any party to this Agreement.

Harvard University's 2009 PLA, the most recent of a series of agreements first negotiated in 1992, states:

> The Owner and Project Contractor have the absolute right to select any qualified contractor for the award of contract(s) on any covered Project.

Nonunion contractors regularly win bids on PLA construction projects. For example, in 1991 the GAO found that 86 of 286 contractors on an Idaho National Engineering Laboratory project covered by a PLA were nonunion (General Accounting Office 1991). A number of nonunion contractors participated in the Southern Nevada Water Authority (SNWA) project, the Boston Harbor Project, and the Big Dig. In testimony before Congress in 1998, Michael D'Antuono, president of Parsons Construction Company, said that six of 16 prime contracts and 26 of 70 both prime and subcontracts went to nonunion firms on the SNWA.[39] Reviewing results for the Boston Harbor Project at the request of John T. Dunlop, ICF Kaiser found that 55 prime contracts went to union contractors and 16 to nonunion contractors; of the 257 prime contracts and subcontracts, 155 went to union firms and 102 to nonunion firms (U.S. Senate 2000). Nonunion site preparation and concrete contractors worked on the Toyota assembly plant in San Antonio in 2004 and 2005.[40]

What is the nonunion contractor required to do with respect to local collective agreements?

All PLAs require that winning bidders sign a letter of assent, which requires that the contractor abide by the terms of the PLA. These will typically include the union agreement or the schedule of wages and benefits. Whether the bidding contractor is required to become signatory to the local agreement varies among PLAs. Some require that winning bidders do so. Others permit them to become signatory to the local agreement only for the work covered by the PLA. Still others require that contractors sign the assent agreement but do not require them to become signatory to the local collective agreement.

The range of language with respect to nonunion contractors is bracketed by the Harvard and Toyota San Antonio agreements. The Harvard agreement requires that the contractor become signatory, but also requires that the union sign an agreement with the contractor:

> The Owner and Project Contractor have the absolute right to select any qualified contractor for the award of contract(s) on any covered Project provided, however, that such Contractor is willing, ready and financially able to execute and comply with this Agreement; has or is eligible to and will sign the applicable local collective bargaining agreement(s) which form the basis for the Schedule A's; and that such Contractor executes, prior to commencement of work, this Agreement or the Letter of Assent. The Unions agree to sign such Contractors.

In contrast, the Toyota agreement does not require that the contractor do more than sign the assent agreement:

> TMMTX and/or the Construction Contractor(s) have the absolute right to select any qualified bidder for the award of contracts on this Project without reference to the existence or non-existence of any agreements between such bidder and any party to this Agreement; provided, however, only that such bidder is willing, ready and able to become a party to and comply with this Project Agreement, should it be designated the successful bidder.

Aside from the cases in which the contractor is required to sign the local agreement for all work, the impact of the PLA on the contractor depends on the PLA's terms with respect to the contractor's labor force and benefits payments.

How will a nonunion contractor obtain the labor needed for the project?

Some nonunion contractors participate in PLA work by operating "double breasted," i.e., by establishing or using a union subsidiary to do the project work. The contractor uses a union workforce, recruits according to union referral rules, and pays into union benefit funds. If the nonunion contractor chooses to participate in this fashion, the only further issue may be bringing key workers in from the nonunion side of the operation.

Where the PLA incorporates a core employee or "drag along" clause, nonunion contractors may bring their own nonunion employees onto the project. Core worker clauses usually require that these employees meet state licensing requirements, are able to work safely, and have worked for the contractor for some minimum time. For example, the contractor may only be able to bring employees who have worked for the contractor for 60 of the last 100 work days. Some clauses allow the contractor to bring as many employees as it needs; others allow the employer to bring in its existing employees in a fixed ratio to the total hired. Under the latter arrangement, a contractor might be allowed to bring one existing employee on for every three hired.[41]

Often, however, the nonunion contractor is required to hire from union sources if it is not able to bring current employees onto the project.[42] The related provision in the Toyota San Antonio PLA states:

(a) Execution contractors who are not signatory to a current local collective bargaining agreement with a Union having jurisdiction over the affected work may employ core employees, as defined in paragraph (b) below, who are San Antonio residents, as defined in Section 3(b) of this Article, without following the referral in Section 3.

a. For purposes of this Agreement, a "core" employee shall:

i. possess any license required by state or federal law for the Project work to be performed;

ii. have been on the execution contractor's payroll for at least sixty (60) of the one hundred (100) working days prior to the date the execution contractor received the contract award; and

iii. have the ability to safely perform the basic functions of the applicable trade.

iv. Upon request of the Union having jurisdiction over the affected work, the execution contractor shall furnish a representative of the Owner with satisfactory evidence of an employee's qualification as a "core" employee.

The provision for core employees found in the Tappan Zee PLA, often used throughout New York, allows nonunion and out-of-area contractors to bring key workers onto the project:

B. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Project work and who meet the following qualifications as determined by a Committee of 3 designated, respectively, by the applicable Local Union, the Construction Project Manager and a mutually selected third party or, in the absence of agreement, the permanent arbitrator (or designee) designated in Article 7:

(1) possess any license required by NYS Law for the Project work to be performed;

(2) have worked a total of at least 1000 hours in the Construction craft during the prior 3 years;

(3) were on the Contractor's active payroll for at least 60 out of 180 calendar days prior to contract award;

(4) have demonstrated ability to perform, safely, basic functions of the applicable trade.

No more than 12 per centum of the employees covered by this agreement, per Contractor by craft, shall be hired through the special provisions above (any fraction shall be rounded to the next highest whole number).

The provision of shop fees, minimum periods, and wage and benefit scales varies. Whether core employees have to pay agency shop fees is controlled by state law. Most PLAs are silent about the provision of evidence that employees have been employed for the minimum period or that wages and benefits in keeping with the union scale are being provided to employees. However, these requirements are likely enforceable under the dispute resolution provisions of the PLA.

Are nonunion workers required to join the union?

Under the National Labor Relations Act's so-called "construction industry provisos," unions and employers may agree to require "as a condition of employment, membership in [a] labor organization after the seventh day following the beginning of employment or the effective date of an agreement, whichever is later."[43] Depending on state law and the terms of the PLA, nonunion workers may be required to pay union dues or agency fees. In almost all cases, nonunion workers will take home more in wages and benefits than they would from working on projects not covered by a PLA, even after paying agency fees.[44] Where religious beliefs preclude an individual from paying dues to a union, there are established protocols for equivalent contributions to charities.

An example of a dues provision that covers nonmembers is found in Article IV of the PLA for the Suffolk County (N.Y.) Center Building:

> **SECTION 5. UNION DUES**
>
> All employees covered by this Agreement shall be subject to the union security provisions contained in the applicable Appendix A Agreement, as amended from time to time, but only for the period of time during which they are performing Covered Work and only to the extent of rendering payment of the applicable monthly union dues uniformly required for union membership in the Signatory Union which represents the craft in which the employee is performing Covered Work. No employee shall be discriminated against at the Project because of the employee's union membership or lack thereof. In the case of unaffiliated employees, the dues payment will be received by the Signatory Union as an agency shop fee.

How will nonunion contractors' employees be provided with benefits? How will nonunion and union contractors be provided a level playing field with respect to the cost of benefits?

Nonunion contractors' benefit plans are typically not as comprehensive, generous, or expensive as those of union contractors. This raises issues about how the employees of nonunion contractors obtain benefit plan coverage while working under a PLA and how the playing field for benefit costs is leveled between union and nonunion contractors. Nonunion contractors have a cost advantage relative to union contractors because of their lower benefit costs. Leveling the playing field, and adhering to the terms of the PLA, requires that nonunion contractors' benefit costs be the same as those of union contractors.

The historic solution to this matter has been to require that nonunion contractors pay into joint labor/management benefit funds. Some nonunion contractors have objected to this system, arguing that, in effect, they are paying twice for their employees' benefits, since they must maintain their own benefit plans while paying into the joint plans. Further, although nonunion workers may benefit from participating in union health insurance plans, there is little gain from short-term enrollment in pension plans. There is also some anecdotal evidence that nonunion employees take advantage of access to the superior coverage provided by union health funds to obtain medical treatments that are not covered or are more costly under their own insurance. Despite considerable discussion of the issue of double payment of benefits (see, for example, Northrup and Alario 1998), actual instances of double payments by open shop contractors working under PLAs are not well documented. This may be, in part, because many nonunion contractors do not provide benefits or do not contribute to those plans. For example, in 2006 only 48% of nonunion construction workers report having health

insurance through their employer; less than 26% report participating in an employment-based retirement plan (CPWR 2009, sections 26 and 27). A survey of larger construction employers by the Associated General Contractors in 2000 found that, although 75% of contractors reported having a 401(k) plan, only half contributed to it (Johnston-Dodds 2001, 37). A 1991 study by the GAO of the Idaho Labs project of the Department of Energy found that, despite many nonunion contractors' stated position that they would not participate in PLA projects, 30% of the 286 contracts for the project went to nonunion contractors (General Accounting Office 1991). Two of the 86 nonunion contractors documented making double benefit payments, and a third was being sued in federal court over a failure to pay at the time the report was issued. Although some instances of double payment of benefits have no doubt occurred since the 1980s, the lack of documented cases in more recent literature suggests that it is uncommon. It is possible that open shop employers are deterred from bidding on PLA projects because, depending on their benefit program and the PLA, they believe that they would have to make double benefit payments.

There are two different methods for administratively leveling the playing field and providing appropriate payments to nonunion workers. The first is that some PLAs require nonunion employers to put the difference between their hourly benefit costs and those paid by signatory contractors into a trust for their employees. The nonunion employee can then draw on the trust to pay insurance premiums, co-pays, and other expenses. The second approach is to put the difference between nonunion and union total compensation into the nonunion employee's paycheck. Both methods level the playing field in terms of benefit costs and avoid the administrative issues (including additional costs) associated with having nonunion workers temporarily participating in joint benefit plans.

Can PLAs be written to allow small and minority businesses to participate in the project?

Carve-outs or exemptions from the terms and conditions of PLAs are found in some agreements. For example, the Port of Oakland PLA, negotiated in 2000, permits small contractors (those receiving less than $300,000 in aggregate payments from the project) to be exempted from the terms of the PLA; the total amount of exemption for small and minority businesses was limited to $15 million (Johnston-Dodds 2001, 43). Such provisions are rare in private sector PLAs. The report *Constructing California: A Review of Project Labor Agreements* shows that only 10% of private sector PLAs had provisions encouraging the participation of small and minority businesses compared to 48% of public sector PLAs. The unions agreed to this provision in the Port of Oakland PLA in part because it was part of a broader program to develop participation from the local low-income community in the area of the port. In this context, the unions were willing to carve out small business exceptions and even extend some valuable privileges to these businesses.

Why would unions agree to provisions that facilitate open shop participation?

Generally, state and local bidding laws require that public projects be open to all qualified bidders. But beyond the legal requirement, unions may also be open to provisions facilitating nonunion participation in situations where they do not have all the capacity required for a project or where the owner desires the participation of specific contractors who are not signatory to the union agreement. Still, agreeing to nonunion labor or minority and small business carve-outs in a PLA is controversial because it may require that some trades sacrifice while others do not. This can create conflict among building trades locals.

Summary

All public and many private PLAs allow any contractors to bid on work without regard to their union status. Successful bidders on covered projects are required to sign the assent agreement and maintain union terms and conditions. They may be required to become signatory to the appropriate local collective agreement. Core worker clauses in PLAs allow nonunion contractors to bring qualified employees on their payrolls onto projects. Differences in benefit costs can be addressed by having nonunion contractors pay the difference between union and open shop compensation into a trust

fund for the use of their employees or pay it directly to their employees in their paychecks. Carve-outs can be used to encourage small business and minority participation in PLAs; they are most often found in PLAs with extensive provisions for community development and social investment.

Negotiating PLAs

PLAs are negotiated by local unions representing the trades involved in a project and the owner or the owner's representative. Because many owners lack experience negotiating contracts, and because of legal requirements as to whom a signatory to labor agreements can be, owners usually delegate the job of negotiating the agreement to the general contractor or construction manager for the project.

Although this arrangement works well in most cases, getting the full value of PLAs for the public requires that the parties to the negotiations be knowledgeable about what can be achieved with PLAs and interested in providing the best outcome possible for the public. Often, however, PLAs are modest documents that do little more than ban work stoppages and commit unions to the prompt provision of labor.

As stated in prior sections, PLAs work best when there is understanding and buy-in from the parties involved in the project. For the same reasons that nationally dictated PLAs do not always elicit the support from local unions needed to address difficult issues, PLAs that only involve some of the parties working on the project may not be as effective as those that bring all parties together. Since parties on both sides of the table may not be well informed about PLAs, bringing in expertise to facilitate the negotiation may be important to attaining the full value from a PLA.

Owners: bringing expertise to bear

The sophistication of the parties varies widely with prior experience with PLAs, and some regions of the country have much more experience than others. In the New York, San Francisco, and Los Angeles metropolitan areas and the Tennessee Valley, long experience has provided unions, contractors, and owners with a depth of experience that allows them to fashion PLAs that address each stakeholder's concerns and provides substantial value to public and private owners. Similarly, when owners like Toyota have long experience with PLAs, they are able to develop sophisticated agreements. Agreements in regions with less experience with PLAs are typically more basic and achieve less than might have been realized. For example, a 2009 PLA at a university in the Midwest did not include language harmonizing working hours or holidays across trades, forgoing the virtually costless gains from such clauses. For those with less experience, simply turning negotiations over to a construction manager is not always the best solution, since not all construction managers are equally versed in PLAs. Further, the owner and construction manager's interests may not be completely aligned, and any differences need to be considered.

No good general reference currently exists on PLAs and PLA language, although several are being developed. By now, however, thousands of PLAs have been negotiated around the country, and they are a good source for model language. Large private-sector operations (e.g., Toyota and Harvard) and public sector projects (e.g., Boston Harbor and the New York State Thruway) may be particularly valuable. The Federal Mediation and Conciliation Service also offers useful resources and expertise.

Contractors: using a multi-craft labor/management council to develop and promote PLAs

Because PLAs are typically the product of negotiations between a construction manager and a local building construction trades council, they afford little or no voice for most contractors, particularly specialty contractors. Interviews with contractors and contractors' representatives revealed somewhat ambivalent feelings about PLAs (Belman, Bodah, and Philips 2007, 36-43). That is, contractors saw the benefits of PLAs for scheduling, safety, and training, but they

voiced concern that PLAs were often conceived with little or no input from them. These contractors were then left to worry that PLA terms and conditions could ultimately change or erode provisions of their own agreements. While some unions and union workers have the same essential concerns, they are at least represented at the bargaining table through their BCTC.

One approach to involving contractors is through using a multi-craft labor/management council (LMC). LMCs are typically associations of representatives of unions and union contractors who meet to discuss issues facing their industry and to work together to promote union construction. The activities of these councils vary greatly from region to region. In some areas the councils meet only when issues arise, while others have extensive ongoing activities such as the TRICON labor/management council's *Better Built* in the Peoria, Ill. area. The LMC council can, working with the BCTD's model PLA, create an area model PLA that would provide the general structure for individual PLAs. Of course, like the BCTD's model, the area model should be flexible enough to account for the unique characteristics of each project.

A case study: the Illowa Construction Labor and Management Council's IMPACT Agreement

Currently, there are scores of construction industry labor/management councils in the U.S., many with a presence on the Internet. A good example of an LMC that has developed and promotes PLAs is the Illowa Construction Labor and Management Council. The Illowa LMC was formed in 1985 to promote union construction in nine counties in Illinois and Iowa. The board of the Illowa LMC has 20 members representing labor and management equally. In 1989, the Illowa LMC created the IMPACT Agreement for use on projects in its region. Over the past 20 years, this agreement has been used on over 230 projects (Belman, Bodah, and Philips 2007).

Among the more important provisions of the IMPACT Agreement, which was developed by labor *and* management, is Article V mandating pre-bid jurisdictional conferences. The purpose of the article is to allow the unions potentially involved to determine work assignments according to craft jurisdiction and to quickly notify bidders of their decisions. The article also provides for a method of dealing with situations where "specialty assignments are made to trade crafts that are not substantially represented by local contractors."[45] Further, Article VIII standardizes holidays and the rate of pay on holidays, which otherwise may differ across collective bargaining agreements. Similarly, Article XI standardizes normal work time and overtime rates, while allowing flexibility in scheduling by mutual agreement. Article X waives all subsistence, travel, and mileage pay. Article XIV requires adherence to local hiring hall provisions, but allows a contractor to hire labor "from any source" if a union is unable to furnish labor within 48 hours of a request. The other provisions of the IMPACT Agreement, such as its strong no-strike/no-lockout clause, are typical of most PLAs.

Starting and maintaining an LMC

There are essentially two models for multi-craft LMCs. One relies strictly on the voluntary participation of labor and management. Financial support for such councils comes by way of voluntary contributions or dues paid at the organizational level by participating unions, contractors, and contractor associations. The second model is a Taft-Hartley labor/management cooperation trust. Such trusts, which are authorized under 29 U.S.C. § 186 (c) 9 and 29 U.S.C. § 175a(a)(1), allow the parties to negotiate for per capita assessments to support an LMC.

In neighboring jurisdictions in New England, both models are in successful use. The Connecticut Construction Labor-Management Council (CCLMC) is an example of an organization established through a trust agreement and supported through a per capita assessment of $.10 per hour on covered employment. Seed money for the CCLMC came from a grant from the Federal Mediation and Conciliation Service. Build Rhode Island (Build RI) is a voluntary association of contractors, contractors' representatives, and unions that relies on contributions from members and not a per capita assessment on work. Both organizations have been successful in developing and promoting PLAs in their areas and in achieving results favorable to public and private owners in their jurisdictions.

PLA item checklist

Although there is still no comprehensive guide to negotiating a PLA, the following checklist could help parties considering the development of a PLA.[46]

1. Purpose
   - If there is a specific date by which the project must be completed, and is it included?
   - Is the need for harmonization of hours and the stabilization of wages mentioned?
   - Is the need for the maintenance of labor peace mentioned along with a dedication to the mutual resolution of disputes?
   - Does the clause contain a no-strike/no-lockout statement?
2. Scope of agreement
   - Is it clear that the PLA is intended only to cover construction work?
   - Is work that is not included clearly stated?
   - Are the various projects and geographic parameters of the site well defined?
   - Does language address site preparation and/or dedicated offsite work?
   - Does the clause clearly state that all contractors, of whatever tier, must accept and be bound by the agreement through a letter of assent?
   - Does the agreement clearly state that the property owner's employees are not covered and the PLA does not create joint-employer status?
   - Is there a supremacy clause stating that the PLA supersedes all other agreements?
3. Union recognition
   - Are the signatory unions recognized as the sole and exclusive representatives of all craft employees?
4. Management's rights
   - Is management specifically given the right to hire, promote, transfer, lay off, or discharge employees, subject only to the provisions of the agreement?
   - Is just cause protection granted?
   - Are restrictions on output, crew size, or the introduction of technology prohibited?
5. Referral of employees
   - Do signatories agree to use the referral procedures maintained by the unions?
   - Is there a provision for unions that do not have an established referral system?
   - Is there a nondiscrimination clause in the agreement?
   - Is there a period (e.g., 48 hours) after which contractors may seek labor from other sources if the union is unable to fulfill a request?
   - Is there language relating to the appointment of foremen?
   - Does the agreement allow for testing or evaluation for those who require special skills?
   - Is there a "key man" or core personnel provision?
   - Is there a clause that prohibits the union from reassigning project employees to another site?
   - Is there a provision for the reemployment of individuals who quit or are terminated for cause, e.g., ineligibility to return to the site for 90 days?
6. Apprentices and trainees
   - Is there language about the employment of apprentices?
   - Does the PLA allow for a uniform journeyman/apprentice ratio?

- Are helpers, trainees, or other sub-journeymen allowed on the project?
- Is the ratio of these other trainees defined?
- Are apprentice or trainee wages defined in the PLA?
- Does the PLA establish any special program for the recruitment or training of apprentices or other trainees, such as minority or female targeting, or a school-to-work program?

7. Wages and benefits
   - Does the PLA contain any direct concessions on wages?
   - Does the PLA contain any direct concession on overtime pay?
   - Does the PLA limit forms of premium pay, such as travel time, high time, etc?
   - Does the agreement limit the joint funds to which contractors must contribute?
   - Does the agreement limit amounts to be contributed to straight-time wages?

8. Work rules
   - These are unique to each project, but may include such matters as rules on the use of equipment, smoking, absenteeism, etc. Often this section is used as a residual category for items that do not fit easily into other sections.

9. Work stoppages and lockouts
   - Is there strong language prohibiting strikes and lockouts, as well as other types of job actions, e.g., slowdowns?
   - Is striking allowed over certain matters, such as delinquency in payments to joint funds?
   - If striking is allowed, is it limited in any way (e.g., must not be accompanied by picketing, hand billing, etc.)?
   - Is notice required for striking?
   - Is there a procedure for determining if a proscribed job action has occurred, and for enforcing the no-strike/no-lockout clause?

10. Grievances and arbitration
    - Does the agreement contain a grievance and arbitration procedure?
    - Are arbitrators named in the PLA?
    - If not, is the source of arbitrators (e.g., AAA, FMCS) defined?
    - Does the agreement define the types of disputes or grievance that are subject to the procedure?
    - Are exceptions made to the grievance/arbitration procedure for industries that have their own settlement procedures?
    - Is the procedure, including the number of steps and individuals involved, clearly defined?
    - Is the employer allowed access to the grievance procedure?
    - Are limits to the arbitrator's authority defined?

11. Jurisdictional disputes
    - Does the PLA reference the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry?
    - Is a provision made for parties that are not stipulated to the plan?
    - Are pre-job conferences required to work out jurisdictional issues?

12. Union security
    - Is there a requirement to join the appropriate union within the statutorily defined period?
    - Is there a maintenance of membership provision?
    - Is an exception made if the project is in a "right-to-work" state?

13. Union representation
    - Is provision made for access to the project by union officials?
    - Are the rules for union access defined?
    - Are rules governing stewards defined?

14. Hours of work
    - Is the workday defined?
    - Are hours of work standardized across crafts?
    - Are break times defined?
    - Are any statements about overtime or overtime distribution included?
    - Are there provisions for shift work and/or flex time?
    - Are uniform holidays specified?
    - Are rules concerning the celebration of holidays that fall on weekends defined?
    - Is there a provision for make-up time?

15. Subcontracting
    - Is subcontracting restricted to those willing to sign a letter of assent?

16. Safety and health
    - Are any special safety programs or safety committees specified in the agreement?
    - Are employees required to receive special safety training or be certified in particular safety procedures?
    - Is a drug and alcohol abuse monitoring or prevention program specified?
    - Is immediate dismissal allowed for safety violations?

17. Saving clause
    - Does the clause preserve the contract if any particular provision is voided by a court of law?
    - Does the clause require the parties to negotiate a substitute agreement for any provision voided under law?

18. Term of agreement
    - Are the start and end dates of the project clearly defined?
    - Is there a provision for rework or a contractor's subsequent involvement with the project?

Summary

PLAs have historically been an agreement between unions and owners, with contractors only becoming involved in the PLA when they win a project bid. An alternative is for unions and contractors to develop a standard PLA that is then used as the foundation for a final PLA that is negotiated with owners. An advantage of this latter approach is that it is in keeping with the deepening of labor/management cooperation in construction and serves to promote the use of PLAs. Further, as demonstrated in the case of the Illowa Construction LMC, contractors will often use the PLA as a means of marketing their services. Finally, in addition to promoting efficiencies, a model PLA created by unions and contractors may provide a foundation for dispute resolution through an LMC.

Conclusion

Although PLAs have been around for years and used on some of the most famous construction projects in American history, their use has become controversial as the nonunion sector of the construction industry has grown and as PLAs have been applied to relatively small projects. Critics argue that PLAs place nonunion contractors at a disadvantage in bidding on projects and raise overall project costs. PLA opponents are particularly critical of the use of PLAs on public projects. They argue that such usage violates the spirit of public bidding statutes by putting the adherence to collectively bargained terms and conditions ahead of best price as a condition for winning a contract.

If designed properly, PLAs can help projects meet deadlines by guaranteeing a steady supply of highly skilled labor and by reconciling the various work routines of the many trades. PLAs also help to assure timely completion by keeping projects free from disruptions resulting from local labor disputes, grievances, or jurisdictional issues. Language in PLAs can be written to advance important policy goals, such as improving training and recruiting members of disadvantaged communities into high-paying jobs in construction.

We hope that this report can move the PLA discussion beyond a debate about whether PLAs are good or bad and toward a more constructive discussion regarding how to create PLAs that help deliver better projects for owners, contractors, workers, and communities.

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Endnotes

1 See *Federal Register* 75(70): 19168-79.

2 For further discussion of this issue, see Weil 2005.

3 This is a growing but not a recent problem; see, for example, Business Roundtable 1982.The main trade journal for the construction industry, *Engineering News-Record,* has carried many articles on this topic during the past two decades. The small size and low graduation rates of nonunion apprenticeship programs have been documented in several studies, including Government Accountability Office 2005, Belman 2005, Argyres and Moir 2008, Bradley and Herzenberg 2002, and Londrigan and Wise 1997.

4 See the series, Unemployment Rate - Construction Industry, Private Wage and Salary Workers Labor Force Status: Unemployment rate: LNU04032231, Bureau of Labor Statistics, U.S. Department of Labor (www.bls.gov).

5 See the series, Unemployment Rate, LNU04000000, Bureau of Labor Statistics, U.S. Department of Labor (www.bls.gov).

6 See USDL-10-0886, Bureau of Labor Statistics, U.S. Department of Labor, and http://www.bls.gov/iag/tgs/iag23.htm.

7 For example, despite a 30% growth in employment in construction jobs from 1997 to 2008, real earnings (earnings adjusted for inflation) were unchanged at the median. Over this period, nominal current dollar earnings grew by less than 0.5% annually at the median (employment data from Employment, Hours and Earnings series CES2000000006; Consumer Price Index Series CUUR0000SA0 and CUUS0000SA0 and 1977 and May 2008 *Occupational Employment Statistics for Construction and Extraction Occupations;* all data from www.bls.gov). It is important to note that, because many of these immigrants are not documented, they are not in a position to request the help of public authorities to enforce labor and contracting laws and so are particularly vulnerable to exploitation by unethical contractors.

8 These interviews were begun as part of the research, supported by Electri International, that resulted in the Belman, Bodah, and Philips (2007) study. This report provides a summary of many of the interviews along with excerpts from some. The interviews, which are part of the authors' ongoing work on PLAs, have included public and private owners and their representatives; the staff of local, national, and international construction firms; local, regional, and national staff and officials of building trades unions; the staff of employer associations; construction consultants; and construction workers. Regulations regarding research with human subjects preclude us from identifying those interviewed.

9 For example, work under a PLA at the San Francisco Airport was reported to be 40 days behind schedule in 1999 because of winter storms in 1997 (see L. Fernandez, "Fewer Stay Out of Work on Day 2 of Strike at SFO," *San Francisco Chronicle,* May 22, 1999).

10 See Belman, Bodah, and Philips 2007, 27-28. Additional interviews not included in this report substantiate this point.

11 For discussions of delays in projects related to skilled labor shortages, see, for example, *The Beige Book: Summary,* Federal Reserve Board, August 11, 1999; "Craft Labor Shortage Provokes More Studies of Pay and Safety," *Engineering News-Record,* August 20, 2001, p. 11; "Worker Gaps in South Push Up Costs; Ramped-Up Katrina and Power Markets Spur New Labor Alliances," *Engineering News-Record,* October 2, 2006, p. 34; "Attracting and Maintaining a Skilled Construction Workforce," Construction Industry Institute Research Report, 2001; "Needed: Skilled Tradespeople," *Sun-Sentinel,* December 19, 1999; and "Refinery and Petrochemical Plant Construction Costs Reach New High," Cambridge Energy Research Associates, 2007, available at www.cera.com/aspx/cda/public1/news/pressReleases/pressReleaseDetails.aspx?CID=9074.

In combination with the commitment to the speedy provision of skilled labor, ready access may not always work to the immediate advantage of the local trades workers. Drawing labor from outside a local's jurisdiction will reduce the labor hours available to area tradesmen. At the least, these provisions reduce local unions' ability to bargain over the use of outside labor.

12 No references were found in a Lexis-Nexis search conducted in August 2009 to work stoppages occurring on projects built under any PLA from 2000 to 2009. However, there were several articles indicating that work on PLA projects continued through trade-wide work stoppages associated with the renegotiation of contracts over this period. This research is discussed in greater detail in the section on dispute resolution. The authors are aware of a disruption of work on a Trump project in Chicago in 2006. In this instance, laborers left the project on a Friday because there was an area-wide work stoppage associated with the renegotiation of the collective agreement. The disruption was not sanctioned by the local union, and local union leadership attempted to get the employees back to work. No other trades left their work, and the site was not picketed. The workers returned to the site on the next workday. The Chicago Building and Construction Trades Council has taken corrective steps to assure that workers are better informed of their responsibilities under a PLA (phone conversation with T. Villanova, president, Chicago Building and Construction Trades Council).

13 Building trades workers working on airport construction struck to express dissatisfaction with a recently ratified contract on May 21, 1999. Union officials were able to end the work stoppage and get workers to resume work in less than 24 hours. Airport officials indicated that the PLA provided a faster and less expensive means of ending the strike than was otherwise available (see L. Fernandez, "Carpenters at Airport Protest Against Union Leadership," *San Francisco Chronicle,* May 21, 1999; "Arbitrator Orders California Carpenters To End Wildcat Strike, Return to Work," *Construction Labor Report,* May 26, 1999; and R.L Blagenorth, "PLA(ing) with the Truth," Op-Ed Column, *Orange County Register,* July 30, 1999.)

14 Problems of coordination of work time and practices across contractors and trades are present throughout construction and are not a feature unique to unionized construction.

15 See, for example, Hill International's estimate of the savings associated with using a PLA on the New York State Thruway Project.

16 See interviews with the Illowa Construction Labor and Management Council members in Belman, Bodah, and Philips 2007.

17 A construction professional at the airport maintained that airlines have been known to sell tickets for departures out of gates yet to be completed.

18 Construction unions have ongoing arrangements that, when locals have certified there is work beyond that which they can handle, workers from other locals will be informed of the need for additional workers. Workers seeking employment benefit by access to work, and contractors benefit because they can quickly find workers with appropriate skills. The arrangements also allow for the transfer of pension and benefits funds to the workers' "home" welfare trust and allow for traveling apprentices to continue their training and earning of work-hour credits on the project.

19 Approximately 60% of the pipe trades' work was covered by PLA agreements at this time.

20 Even parties strongly opposed to PLAs have difficulty finding examples of PLAs that were not completed on time because of labor issues. The Associated Builders and Contractors often cites the delay in the completion of the Milwaukee Stadium as a PLA gone awry, but the description omits important details. The project was initially delayed by the need to reweld improperly constructed roof sections. These sections had been fabricated in Asia and brought to the stadium site, where the improper welds were discovered. Rewelding placed the project behind schedule. The stadium was further delayed when a crane lifting roof sections collapsed during a high wind. Three ironworkers were killed, and there was extensive damage to the stadium because it was struck by the crane and a roof section. A review of the accident revealed that the ironworkers had requested that work be delayed because of high winds but the work was ordered to proceed. Had the ironworkers request been respected, the fatalities might have been prevented, and the stadium might have been completed on time. The delay had nothing to do with the use of a PLA.

21 See Lepatner 2007, 34-49 for a recent discussion of this issue.

22 A discussion of the interconnectedness between greening the economy and moving disadvantaged groups into the middle class through construction is found in *Rebuilding Our Economy and Rebuilding the Middle Class: A Building and Construction Trades Perspective on Critical Issues of Social Equity, Economic Justice, Environmental Sustainability, Labor Standards, and Workers' Rights* (January 2, 2009).

23 Stakeholders include the port representatives, the community, the unions, and employers.

24 Interview with Neil Struthers, CEO, Santa Clara and San Benito Counties Building and Construction Trades Council, August 3, 2010.

25 The trades included are carpentry/drywall, taping, interior finishes/painting, electrical, plumbing, communication and low voltage cabling, masonry, HVAC, finish carpentry work, and fire protection. A discussion of the training provided to students through the PLA can be found in "Funding Delay in Buffalo School Project Jeopardizing Union Apprentice Program," *Construction Labor Report,* November 19, 2003.

26 Based on a 2008 discussion with officers of the Saskatchewan Building Trades Council.

27 See http://www.bls.gov

28 See http://bls.gov/iif/ for data from 2003 to 2008. Prior data may be obtained from CPWR 2007.

29 This list of elements was suggested by Prof. David Weil of the Kennedy School of Government at Harvard University.

30 This outstanding record with respect to fatalities and injuries associated with accidents stands in stark contrast to the respiratory illness suffered by WTC rescue and construction workers. These illnesses were caused by breathing in the cloud of toxic materials at and around the WTC site. The most severe exposures occurred immediately following the collapse of the WTC, when the most particulates were airborne. The assurances of the Environmental Protection Agency that the site was safe with regard to respiratory conditions, as well as the failure of other federal and state agencies to identify the well-established dangers of breathing toxic materials at demolition sites, resulted in many workers believing that there were no respiratory hazards.

For example, the first paragraph of an EPA press release on September 13 said that the EPA was "taking steps to ensure the safety of rescue workers and the public at the World Trade Center and Pentagon disaster sites...." (EPA press releases are available at http://www.epa.gov/wtc/releases.htm). This was reiterated in third paragraph:

> EPA's primary concern is to ensure that rescue workers and the public are not exposed to elevated levels of asbestos, acidic gases or other contaminants from the debris....
>
> EPA is taking steps to ensure that response units implement appropriate engineering controls to minimize environmental hazards, such as water sprays and rinsing to prevent or minimize potential exposure and limit releases of potential contaminants beyond the debris site.

Having taken responsibility for monitoring toxic materials at the World Trade Center site, the EPA continually assured the public and rescue crews that hazards were minimal and appropriate steps were being taken to address those hazards. For example, EPA Administrator Christie Todd Whitman is quoted in a September 18 EPA press release:

> We are very encouraged that the results from our monitoring of air quality and drinking water conditions in both New York and near the Pentagon show that the public in these areas is not being exposed to excessive levels of asbestos or other harmful substances....

On September 21, an EPA press release again quoted Whitman reassuring the public:

> As we continue to monitor drinking water in and around New York City, and as EPA gets more comprehensive analysis of this monitoring data, I am relieved to be able to reassure New York and New Jersey residents that a host of potential contaminants are either not detectable or are below the Agency's concern levels....Results we have just received on drinking water quality show that not only is asbestos not detectable, but also we can not detect any bacterial contamination, PCBs or pesticides.

The established hazards of working on a demolition site, particularly those caused by inhaling highly base concrete dust laced with a variety of toxic materials, were not discussed; the main emphasis was the effect of dust on aggravating asthma:

> ...EPA's primary concern has been to ensure that rescue workers and the public are not being exposed to elevated levels of potentially hazardous contaminants in the dust and debris, especially where practical solutions are available to reduce exposure. EPA has assisted efforts to provide dust masks to rescue workers to minimize inhalation of dust. EPA also recommends that the blast site debris continue to be kept wet, which helps to significantly reduce the amount of airborne dust which can aggravate respiratory ailments such as asthma. On-site facilities are being made available for rescue workers to clean themselves, change their clothing and to have dust-laden clothes cleaned separately from normal household wash.

The early failure to inform workers about the well-established hazards of demolition sites and to provide appropriate protection to those working on the site complicated later efforts to implement programs to provide respiratory protection. By the time safety programs were implemented, many of those on the site were resistant to use of appropriate protections. This reluctance may have reflected some fear on the part of rescue and demolition workers to admit, given their high level of exposure, that they may already have suffered respiratory injury.

31 This discussion is drawn from "Prevention Efforts and Protection of Worker Health and Safety at the World Trade Center Emergency Project," an unpublished manuscript by Grabelsky (n.d.), and from Colletti, Malloy, Grabelsky, and Platner 2002.

32 In contrast, Opfer, Son, and Gambatese (n.d.) found little evidence of a safety effect when examining the Southern Nevada Water Authority (SNWA) project. They compared the recordable incident rate and the lost-workday case incident rate between the construction industry as a whole, the SNWA project, and rates reported by the Construction Industry Institute. While the safety statistics comparing the project with the national construction average looked favorable, the same was not true when the Construction Industry Institute figures were used. The authors suggest that the safety record on the project was not good when one accounts for Kaiser's experience and size and the nature of the project. The differences in the findings between these studies are not surprising. The PLAs had very different emphases on safety and safety language. While the Boston Harbor Project and its PLA provided specific safety language and created safety programs, the SNWA project did little more than reference contractors' existing programs. The differences in outcomes then likely reflect a difference in the importance accorded safety.

33 Information on the safety and health program for the Boston Harbor Project and the role played by the Boston Harbor PLA were provided by Joseph Dart, former president of the Massachusetts Building Trades Council, and Joseph Nigro, the lead safety and health representative for the council. The Boston Harbor Project included two large underground and underwater tunnels, one of which extended 9.5 miles offshore, as well as extensive facilities to move waste to the Deer Island Treatment Plant (see Armstong and Wallace 2001, 3-4.

34 Such issues are unlikely to arise when provisions in the PLA or local agreement create a structure, such as standing safety committees, in which safety issues can be addressed expeditiously.

35 For example, if a job requires four workers and is being disputed by carpenters and laborers, an arbitrator may assign the work to two carpenters and two laborers (or any combination equaling four), but may not require four carpenters and four laborers.

36 Researchers at Suffolk University's Beacon Hill Institute recently studied whether the lack of PLAs on federal government projects during the Bush administration resulted in delays in construction. They could find no evidence of delays during this period (Tuerck, Glassman, and Bachman 2009).

37 Union work rules also limit nonunion contractors ability to use independent contractors and restrict their classification of employees.

38 As discussed later in this section, the GAO (1991) reports that three of 86 nonunion contractors on Idaho Labs projects made double payments into benefit funds. Other reports discuss the possibility of this occurring, but do not document cases when it occurred.

39 Testimony before the Small Business Committee, U.S. House of Representatives, Hearing Transcript 105-63, August 6, 1998, Washington D.C.: U.S. Government Printing Office.

40 Discussion with Giz Kaczarowoski, director of field service, Building and Construction Trades Department, AFL-CIO (2009), and Mike Haller, Walbridge Construction (2008).

41 These clauses are useful both to nonunion contractors and out-of-area union contractors who need to bring key workers onto a project.

42 In contrast to its San Antonio PLA, Toyota's 2007 PLA for Blue Springs, Miss. has a core worker provision that allows nonsignatory contractors to bring five current employees who live in the area of the project, or 50% of their workforce, onto the job without regard to use of the union referral system. The union referral procedure must be used for any additional employees.

43 Section 8(f)(2) of the National Labor Relations Act. Subsequent court cases have made such union shop clauses difficult to enforce to their fullest extent. See, for example, *NLRB v. General Motors Corp.* 373 US 734 (1963) and *Plumbers Local 141 v. NLRB* 675 F.2d. 1257 (1982).

44 Nonunion workers might be worse off economically on projects covered by state prevailing wage laws in states in which the prevailing wage is set to collectively bargained wages and benefits. However, work by Allen Smith (e.g., "Benefits Fraud on Prevailing Wage Jobs: Apprenticeship, Health and Welfare, and Pension," presentation for the CPWR Construction Economics Research Network, 2009) reveals pervasive underpayments in open shops of the benefits required under prevailing wage laws. The enforcement procedures incorporated into PLAs better assure that open shop workers receive full wages and benefits.

45 Specialty assignments may occur where the installation of specialized machinery or construction techniques that are unfamiliar to local workers requires bringing in out-of-area employees.

46 This checklist also appeared in Belman, Bodah, and Philips (2007).

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Project Labor Agreements' Effect on School Construction Costs in Massachusetts

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This paper investigates the impact of Project Labor Agreements (PLAs) on school construction cost in Massachusetts. Although simple models exhibit a large positive effect of PLAs on construction costs, such effects are absent from more completely specified models. Further investigation finds sufficient dissimilarity in schools built with and without PLAs that it is difficult to distinguish the cost effects of PLAs from the cost effects of factors that underlie the use of PLAs.

Introduction

CONSTRUCTION INDUSTRY PROJECT LABOR AGREEMENTS (PLAs) are collectively bargained pre-hire labor contracts negotiated between property owners and building trades unions. The essential features of PLAs are that successful bidders—even those operating non-union—must adhere to requirements for union referral, union security, and collectively bargained compensation. In exchange, unions assure timely access to labor and typically agree to harmonize work scheduling provisions among the trades, forego certain types of premium pay or pay increases, and give up the right to strike for the duration of the project. Building trades unions have increasingly used PLAs to protect and expand their position in construction markets. Open shop contractors and their trade organizations have responded with legal and political challenges to many publicly funded PLAs such as the Boston Harbor and New York State Thruway projects. The debate over PLAs has focused on project timeliness, quality, safety, training,

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minority employment, employee benefits, and labor peace; however, the central issue has been their effects on public construction costs. The zigzags in federal policy on PLAs over the last 20 years reflect the intensity of this debate.[1]

The current research investigates the effect of PLAs on the cost of new school construction in Massachusetts between 1996 and 2002. Using models with few explanatory variables, prior research on school construction found that PLAs increased bid price between $12.91 and $25.67 per square foot, or 14–17 percent in the Greater Boston area (Bachman et al. 2003). A concern with leanly specified models is that the PLA variable may proxy omitted characteristics that also influence construction costs. To correct for this, the current authors collected unique data on new school construction in Massachusetts. Using these detailed data, we develop a more complete model of school construction costs incorporating information on features such as swimming pools, mechanical systems, non-classroom space, and athletic facilities that architects and engineers use to estimate project costs. Our initial estimates suggest that (1) much of the PLA effect is attributable to the higher costs of building within the city of Boston and (2) although PLAs are associated with substantially higher costs in leanly specified models, there is not a statistically significant relationship between the PLAs and construction costs in more complete models.

Although more completely specified models are preferred in establishing the *ceteris paribus* effect of PLAs, our research finds substantial multi-collinearity between the PLA variable and measures of school characteristics in the more complete models. This is a product of the relationship between project complexity and the decisions to use a PLA; more complex and expensive projects are more likely to use PLAs. In combination with the relatively small number of observations in construction data sets, this precludes accurate estimation of cost effects of PLAs in an adequately specified model. In essence, using extant data it is not possible to estimate the effect of PLAs *holding all else equal.*

Background and Research on PLAs

Although nascent PLAs date to World War I, PLAs came into widespread use following World War II on atomic energy, defense, and space projects

[1] PLAs were widely used as a federal contracting tool from the 1950s on. President George H. W. Bush barred use of PLAs on new federal or federally funded projects immediately prior to the 1992 election (Executive Order 12818). President Clinton revoked 12818, restoring the prior status quo, in early 1993 (Executive Order 12836). This was augmented in 1997 with a memorandum providing criteria for use of a PLA and the minimum terms to be incorporated into an agreement. President George W. Bush banned the use of PLAs on federal projects shortly after taking office in 2001 (Executive Order 13202). In turn, President Obama revoked 13202 and restored the use of PLAs in federal contracting on February 6, 2009.

(Dunlop 2002; McCartin 1997). These agreements banned work stoppages and provided uniform premium pay, shift, and holiday provisions across trades. Project owners and contractors operating in the densely organized industrial and heavy construction sector favored PLAs as they banned contract and jurisdictional strikes and often provided more favorable terms than local agreements (Belman, Bodah, and Phillips 2007). This began to change with the increasing capacity of the open-shop sector in the 1970s and 1980s (Allen 1988; Linder 1999). Non-union contractors viewed PLA requirements as an impediment to competing for work. Working through the Associated Builders and Contractors, the open-shop sector has mounted legal, political, and media challenges to public sector PLAs. The legal strategy foundered when the U.S. Supreme Court (1993) allowed public bodies to sign PLAs in their role as construction owners in its *Boston Harbor* decision. Parallel decisions by New York and Massachusetts courts have upheld the right of public bodies to use PLAs where they can be shown to provide advantages.

Conflict over PLAs then moved into the political arena of administrative and legislative bodies. There, public debate has centered on the effect of PLAs on construction costs. Opponents of PLAs argue that the requirement to follow union employment practices raises costs by compelling open-shop contractors to pay higher wages and benefits and adopt inefficient labor practices. PLAs are also theorized to raise bid costs by reducing the number of competitors bidding on projects when open-shop firms decide not to compete for work. Proponents argue that PLAs improve projects' timeliness and reduce costs by providing access to skilled labor on a timely basis, by improving labor productivity by harmonizing hours of work across trades, providing favorable overtime rates, replacing strikes with dispute resolution procedures, and sometimes providing wage concessions. These are theorized to reduce costs by shortening time to completion, avoiding delays, and reducing labor input. The effects are especially important on time-sensitive projects such as airports, hospitals, and manufacturing facilities. Timely completion allows projects to begin earning revenues sooner and avoid logistic problems such as those that occur when schools are not completed on time.

The Current Research

The current research is not, in construction parlance, a greenfield project. Prior research found PLAs raised school construction costs by 14–17 percent in the Greater Boston area (Bachman et al. 2003). These results were obtained from leanly specified models: the favored specification included only a PLA indicator, a measure of project size, and whether the project was a new

construction or a renovation.[2] The current research extends this work by measuring the cost impact of PLAs within a more complete model of school construction costs, enlarging the area under study from Greater Boston to all of Massachusetts, limiting the sample to new construction, using final cost rather than bid price, and investigating the relationship between project complexities, use of PLAs, and cost measures. In developing a more complete model of school construction costs, we explore the claim made by Bachman et al. (2003) that PLA and non-PLA schools are similar and little is to be gained from extensive control for the characteristics of construction (Bachman et al. 2003: 8).

The principal source of data for project-based construction research has been the F. W. Dodge Construction Reports. Dodge Reports include virtually every project with a bid price of over one million dollars, with several reports issued during the course of a construction project. All provide the project name, location, type, size, owner, architect and, after the contract award, the general contractor. Depending on when a report is issued, successive reports will also provide an architect's estimate of project costs, the low bid, or the final offered cost. Although the Dodge Reports have long been used by contractors, they can be inadequate for construction research. The specification information is non-uniform and incomplete. Dodge Reports do not include the final cost of the project when completed or information on how the project changed after the final cost offer. The cost measures available from Dodge are then noisy proxies of completed cost—the true measure of concern to the public.[3]

Given these deficiencies in Dodge construction information, we identified factors believed to affect school construction costs from estimating guides and discussions with construction professionals.[4] The basic unit of a school is the classroom, which occupies the majority of school space and accounts for the bulk of school costs. In addition to classrooms, cost is affected by other types of spaces—including offices, libraries, cooking and dining areas, and athletic facilities. Gymnasiums and auditoriums are more costly than classrooms, and exterior appurtenances such as playing fields add to the bottom line. Site preparation, such as demolition and abatement, also increase project costs, as does

[2] Other models included measures of whether the school was an elementary school, the number of floors, and the distance from Boston. The basic model was also estimated by type of school (elementary/non-elementary) and project size (Bachman et al. 2003).

[3] As the primary Dodge audience uses reports to learn about opportunities to bid on projects, timeliness, rather than absolute accuracy, is an overriding concern. Comparisons of Dodge square footage with final size reported to our survey found that the Dodge Reports were within 1000 square feet for thirty-nine of the seventy schools, between 1000 and 5000 feet off for seven schools, between 5000 and 10,000 feet off for four schools, between 10,000 and 20,000 feet off for five schools, and more than 20,000 feet off for six schools.

[4] See *Square Foot Costs* (R.S. Means Co. 2001) and *Building and Renovating Schools* (Macaluso, Lewek, and Murphy 2004).

extensive grading and foundation work. Mechanical systems typically comprise about 15–20 percent of project costs, and systems, such as boilers for heating and water-fed coolers for air conditioning, are more expensive than others. The number of floors in a building has an impact on cost, as does the quality of the construction materials selected. Finally, the educational level of the school is an important determinant of cost as high and middle schools include expensive amenities, such as science and computer laboratories, as well as more elaborate library facilities and auditoriums.

Given our focus on final cost, we used Dodge Reports to identify completed projects from the Dodge List of 2001–2002 starts as well as projects included in prior research. Our study was limited to new construction and projects where the costs of new construction could be separated from the cost of renovations.[5] We contacted architects, contractors, and school officials and, using a consistent list of potential school characteristics, surveyed these parties about project features including the final cost, type of school, type of contract, number of stories, roof pitch, particulars of each project (library, science labs, athletic fields, etc.), site grading, type of mechanical system(s) installed, materials used, and bidding process, and whether there was a liquidated damage clause in the school construction contract. Our survey obtained information on seventy of the seventy-five new schools in Massachusetts for which construction was completed by fall 2003.[6] Information regarding the presence of PLAs was obtained from the Massachusetts Building Trades Council.

Characteristics of PLA and non-PLA Schools

Of the seventy schools in our sample, nine, or 12.9 percent, were built under a PLA (Table 1). PLA schools were larger than non-PLA schools, 172,000 feet against 118,000 square feet; taller, 3.3 against 2.6 stories; more likely to have vocational classrooms, 77.8 vs. 24.6 percent, and more likely to have science classrooms, 100 vs. 65.6 percent. Every PLA project involved demolition work against only half of the non-PLA schools. All nine schools built under a PLA-installed chillers against 45.9 percent of the non-PLA schools. Non-PLA schools were more likely to have tennis courts, 16.4 vs. 0.0 percent. PLA schools also had higher total final costs, $26.8 million against $17.4 million, and cost per square foot, $164.91 against $147.86. Given these

[5] Renovation projects were excluded because of their inherent heterogeneity and problems in defining and measuring key data such as the physical area of the renovation.

[6] We were unable to get responses from contractors or architects for five of the schools on our list.

TABLE 1

VARIABLE NAMES, DEFINITIONS, AND MEANS BY PROJECT LABOR AGREEMENT (PLA) STATUS, MASSACHUSETTS

Variable	Description	Minimum	Maximum	Mean all	Mean w/PLA	Mean non-PLA
PLA	Project built under a PLA	0	1	0.129	1	0
Dodge total cost	Total cost, Dodge Reports	$2.6 mil.	$42.0 mil.	$17.5 mil.	$24.4 mil.	$16.5 mil.
Dodge area (sq. ft.)	Square foot area from Dodge Reports	20,000	284,000	125,337	172,093	117,955
Dodge cost per square foot	dodgetotalcost/ dodgeareaft2	$82.76	$1099.54	$155.34	$141.67	$157.40
Adjusted total cost	Survey total cost, 2002 prices by Engineering News Record Cost Index	$2.9 mil.	$47.0 mil.	$18.6 mil.	$26.8 mil.	$17.4 mil.
Area (sq. ft.)	Survey square foot of the project	23,000	284,000	127,109	162,724	121,855
Cost/square foot, adjusted 2002	totalcostadjusted2002/areaft2	$96.68	$293.15	$150.05	$164.91	$147.86
Elementary	Elementary school	0	1	0.486	0.444	0.491
Other	Other type of school	0	1	0.171	0.333	0.148
Private	Private school dummy	0	1	0.043	0.000	0.049
Story	Number of stories	1	4	2.686	3.333	2.590
Basement	Basement in school	0	1	0.071	0.111	0.066
Demolition	Demolition performed	0	1	0.557	1.000	0.492
Boiler	Boiler installed	0	1	0.971	1.000	0.967
Chiller	Chiller installed	0	1	0.529	1.000	0.459
Central air	Central air installed	0	1	0.386	0.222	0.410
Unit ventilators	Unit ventilators installed	0	1	0.629	0.667	0.623
Ground-coupled heat pump	Ground-coupled heat pump installed	0	1	0.043	0.000	0.049
Unitary package	Unitary package installed	0	1	0.214	0.333	0.197
Steep	Roof pitch—steep	0	1	0.157	0.000	0.180
Low	Roof pitch—low	0	1	0.500	0.889	0.443
Combination	Roof pitch—combination	0	1	0.343	0.111	0.377
Swimming pool	Swimming pool erected	0	1	0.029	0.111	0.016
Cafetorium	Cafetorium erected	0	1	0.614	0.333	0.656
Bandroom	Band room erected	0	1	0.800	0.667	0.820
Auditorium	Auditorium erected	0	1	0.386	0.889	0.311
Elevators	Elevators installed	0	1	0.957	1.000	0.951
Gymnasium	Gymnasium erected	0	1	0.929	0.889	0.934
Kitchen	Kitchen erected	0	1	0.886	1.000	0.869
Library	Library erected	0	1	0.971	1.000	0.967
Science labs	Science labs erected	0	1	0.700	1.000	0.656
Vocational rooms	Vocational shops and labs	0	1	0.314	0.778	0.246
Extensive grading	Leveling of hills, filling of valleys, or similar-scale work	0	1	0.543	0.333	0.574
Normal grading	Clearing urban site, grading a corn field, or similar	0	1	0.457	0.667	0.426
Athletic	Athletic field(s) created (football, soccer, track, etc.)	0	1	0.686	0.667	0.689
Tennis courts	Tennis courts erected	0	1	0.143	0.000	0.164
Boston	Boston School District	0	1	0.057	0.333	0.016

differences, distinguishing the effect of differences in characteristics from the cost effects of a PLA *per se* is central to this research.

Estimation Strategy and Results

We begin by comparing estimates of PLA effects from leanly and more fully specified models using both linear and log cost models. The second section investigates the sensitivity of estimates to controls for construction in the city of Boston as well as difficulties, related to multi-collinearity and over-determination, in distinguishing the effect of PLAs on school costs from the effects on cost-affecting factors that also affect the adoption of PLAs. Finally, we compare the current research with that of Bachman et al. (2003).

Final Cost Models. We estimate our final cost models with two dependent variables: final cost per square foot and log of total cost. Cost per square foot is widely used in construction research but requires costs to be proportional to project size. Although appropriate for characteristics such as classrooms, other features, such as athletic fields and demolition, may not be proportional. Log total cost models estimate the percent increase in total cost associated with a feature.

Cost Per Square Foot Models. Our initial specification is similar to prior work with cost per square foot determined by area in square feet, area-squared, and an indicator that takes a value of one when a school is built under a PLA (Table 2, Model 1). Project size has a negative convex relationship to cost per square foot. Larger projects cost less per square foot but the decline attenuates as project size increases. PLAs are estimated to increase construction costs by $28.57 per square foot; the null of no PLA effect is rejected in better than a 5-percent, one-tailed test. This model accounts for 24 percent of the variation in school costs.

Model 2 adds five characteristics that our interviews suggested should have a large effect on school costs: the number of stories, whether the school was an elementary school, a private school, had a basement, or involved demolition work. Elementary schools cost $25.85 less per square foot, the coefficient is significant in any conventional test. Basements add $13.46 per square foot to school cost, the coefficient is significant in a 10-percent one-tailed test. The private school, story, and demolition coefficients are correctly signed but are not individually statistically significant. r^2 increases, from 24.1 percent in Model 1 to 35.1 percent in Model 2. An F-test for the significance of the

TABLE 2

ESTIMATION OF MASSACHUSETTS SCHOOL CONSTRUCTION COST, ACTUAL COST PER SQUARE FOOT

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
Project Labor Agreement	28.57	2.18	24.10	1.53	23.28	1.19	13.80	1.18	13.88	0.81
Area (sq. ft.)	−0.0008	−2.30	−0.0010	−4.31	−0.0006	−1.19	−0.0011	−4.63	−0.0008	−1.59
Area-squared	2.02*E*–09	2.20	2.42*E*–09	3.68	1.11*E*–09	0.71	2.76*E*–09	4.00	1.75*E*–09	1.12
Elementary			−25.85	−3.17	−26.90	−2.15	−27.10	−3.33	−29.88	−2.45
Private			−20.97	−0.54	9.10	0.30	−39.34	−0.82	−12.45	−0.35
Story			6.16	0.89	−1.73	−0.24	7.92	1.12	−0.31	−0.04
Basement			13.46	1.29	10.34	0.76	7.81	0.65	5.02	0.32
Demolition			5.47	0.74	−0.22	−0.02	3.69	0.50	−1.67	−0.18
Boiler					69.68	2.22			70.85	2.34
Chiller					9.11	0.95			6.76	0.72
Central air					1.56	0.21			0.39	0.05
Unit ventilators					0.38	0.04			1.26	0.13
Ground coupled					10.57	0.75			12.17	0.74
Unitary packaged					4.58	0.38			−0.34	−0.03
Steep					17.23	1.23			16.89	1.23
Combination					10.41	1.27			11.97	1.34
Swimming pool					33.02	1.85			19.02	1.23
Cafetorium					1.90	0.23			0.44	0.05
Band room					−3.04	−0.21			−7.56	−0.53
Auditorium					14.80	1.45			14.92	1.43
Elevators					12.51	0.84			13.68	0.89
Gymnasium					−53.07	−2.56			−55.81	−2.57
Kitchen					11.05	0.62			8.99	0.48
Library					29.70	0.74			42.30	1.01
Science labs					1.21	0.12			−1.93	−0.18
Vocational rooms					−10.94	−0.92			−9.73	−0.81
Extensive grading					0.56	0.04			1.63	0.12
Athletic					−3.01	−0.28			−0.05	0.00
Tennis courts					18.02	1.01			16.51	0.91
Boston							34.11	2.10	39.65	2.78
Constant	197.51	7.57	213.23	9.22	132.17	2.21	219.57	9.27	140.25	2.22
r^2	0.2409		0.3513		0.6259		0.3878		0.6512	
F-statistic-1/ *p*-value	3.11/0.0156		3.39/0.0001		3.39/0.0001		8.59/0.0043		17.02/0.0000	
F-statistic-2/ *p*-value			2.73/0.0017		4.40/0.0407		7.74/0.0075			

NOTES: All models are estimated with seventy observations. *F*-test-1 tests the current model's specification against Model 1. *F*-test-2 tests the current specification against the immediately prior specification. For Models 4 and 5, the prior specification is the model omitting the Boston variable. Estimates allow for random error components by school district where there is more than one project in a district and for heterogeneity in the error term with the Huber–White correction. Costs are deflated using the *Engineering News Record* construction cost index for Boston.

additional variables rejects the null of all of the coefficients being zero in better than a 1-percent test.[7] With the addition of these variables, the effect of PLAs declines to $24.10 per square foot and is only significant in a one-tailed, 10-percent test.

Model 3 provides a more comprehensive model of school costs with the addition of school and project characteristics. With few exceptions, coefficients are correctly signed and are of moderate magnitude. For example, swimming pools, a particularly expensive amenity, are estimated to add $33.01 per square foot whereas auditoriums add $14.80 per square foot. Many variables are not statistically significant of themselves, but r^2 rises to 62.9 percent; an F-test that the coefficients on the additional variables are all equal to zero rejects the null in better than a 1-percent test. The PLA coefficient is smaller in Model 2 and is no longer significant in conventional tests.

Models 4 and 5 add a control for construction in the Boston School District to Models 2 and 3, respectively. Four schools were built in the Boston School District during the period under study; three were public schools built under PLAs and one was a private school. Urban construction is typically more expensive than construction in suburban or rural areas because of the difficulties of working in urban areas. For example, marshalling yards have to be established away from the construction site. Renting yards is costly in itself; moving materials and equipment from yards to the construction site also consumes time and resources. In addition, the more rigorous building standards of central cities also increase costs, as does the need to guard against theft and damage.[8]

Our estimates suggest that construction in Boston adds between $34.11 (Model 4, Table 2) and $39.65 (Model 5, Table 2) to the square foot cost of a school, the null is rejected in a 5-percent test in Model 4 and a 1-percent test in Model 5. Addition of the Boston variable improves the fit of the model; r^2 increases to 38.8 percent in Model 5 and 65.12 percent in Model 6. The Boston variable causes a marked decline in the PLA coefficient, from $23–$24 per square foot in Models 2 and 3 to $13.80–$13.90 in Models 4 and 5, the PLA coefficient is not significant in conventional tests. These results suggest that the PLA coefficient was proxying for the effect of construction in Boston in the leaner models.

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[7] We provide two F-tests for group significance. As the ordering of the addition of variables to Model 1 is arbitrary, the upper test in Table 2 compares the specification for the column with Model 1 specification. The lower F-test is a comparison with the immediately previous specification. As we allow for non-independence and heterogeneity in our error structure we only calculate r^2 and do not calculate $\bar{r}^2$.

[8] The 24-hour protection of public building sites in Boston add about $3.00 per square foot to costs.

TABLE 5

COMPARISON OF BACHMAN ET AL. WITH SIMILARLY SPECIFIED MODEL USING CURRENT DATA

Variable	Bachman et al.		Current research
	Preferred model	New school sample	Dodge bid cost sample
Project Labor Agreement	18.83 (4.79)	14.90 (significant at 1 percent)	16.77 (1.32)
New	−17.89 (6.6)		
Square feet (100,000s)	−12.36 (2.5)	a	−30.0 (1.24)
Sq. ft.-squared (100,000)		a	7.87*E*–09 (1.20)
Constant	138.7 (28.0)	a	358.70 (2.03)

NOTES: [a]Variable included but estimates not reported.

SOURCE: Bachman et al. 2003. *Project Labor Agreements and the Cost of School Construction in Massachusetts.* Boston: Beacon Hill Institute; http://www.beaconhill.org/BHIStudies/PLApolicystudy12903.pdf

the sample find that PLAs increase the cost of construction by $14.90 per square foot (Table 5, column 2).

How do our estimates compare with these? The PLA coefficient in the most comparable model in our research, Model 1 in Table 2, is $28.77, twice that of Bachman et al. However, our dependent variable is final cost, not bid cost. Substituting costs from the Dodge Reports for final cost for the sixty-one schools for which we have this data, we find that PLAs increase cost per square foot by $16.77, similar to Bachman et al.'s new school estimates.[16] These results provide reasonable assurance that the differences between our work and that of Bachman et al. is not driven by differences in samples or estimation techniques; our finding on the conflation of PLA effects with those of school characteristics associated with the use of PLAs in lean specification extends to prior research.

Conclusion

The effect of PLAs on the performance of school construction has become increasingly controversial. Prior work has found that PLAs substantially increase the cost of school construction. The current research extends this earlier work by examining the effect of more complete specifications and considers the interaction between school characteristics, adoption of PLAs, and distinguishing the cost of characteristics from the cost of PLAs. Our estimates suggest that, although lean specifications find that PLAs raise the cost of school construction, this does not characterize more complete specifications that better fit the data. However, the more complete specifications suffer from

[16] The estimated effect of the PLA variable for the final cost of new schools is $23.28, about $5.00 per square foot lower, in the sample of sixty-one schools for which we have the Dodge bid price.

multi-collinearity and over-determination. Detailed analysis of the data suggests that the measured PLA effect is because of the three public schools in Boston and that PLAs do not affect school costs outside of the Boston School District. Further, propensity analysis suggests it is not possible to disentangle the effect of PLAs on school costs from the effects of school characteristics that underlay the decision to adopt a PLA. Although it should be possible to disentangle these cost effects with a substantially larger data set, assembling such a data set would be challenging.

This study does not provide a certain answer to the question "why PLAs?" Belman, Bodah, and Phillips (2007) suggest that PLAs are often used where there are hard deadlines for the completion of projects, where the success of a construction project depends on timely access to qualified labor, and where delay has large costs.[17] It may then be that PLAs are neutral on direct construction costs, but are advantageous to owners for whom timeliness is paramount.

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[17] Toyota has used PLAs on all of its major construction projects, more than 38 million hours of construction labor, since the mid-1980s.